

Tecno-Sovereignty: An Indigenous Theory and Praxis of Media

Articulated Through Art, Technology, and Learning

by

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ABSTRACT

Scholars have diversified notions of sovereignty with indigenous frameworks ranging from native sovereignty to cultural sovereignty. Within this range, there exists only a small body of research investigating technology in relation to indigenous sovereignty, excepting the colonial implications of guns, germs, film, and literacy. Furthermore, there is a lack of inquiry on how indigenous peoples operationalize their sovereignty through designs and uses of technology that combine emerging digital media technologies, old electronic media, and traditional indigenous media. This “indigenous convolution media” leads to what is referred to in this research as Indigenous Technological Sovereignty or “Tecno-Sovereignty.”

This dissertation begins to address knowledge gaps regarding the dynamic relationship between technology and indigenous sovereignty, and it posits that Tecno-Sovereignty is operationalized when indigenous groups exercise their own self-determined designs and uses of mediums and media to address their particular needs and desires. Therefore, Tecno-Sovereignty is comprised of the social, cultural, political, and economic effects of indigenous technology. This dissertation, a compendium of essays, presents an indigenous theory of media and sovereignty: defining a vision of Tecno-Sovereignty; arguing the purpose and importance of Tecno-Sovereignty; demonstrating how Tecno-Sovereignty is operationalized; and revealing capacity-building recommendations for the further development of indigenous technological sovereignty. Additionally, this research, through an exhibition of indigenous convolution media, calls attention to indigenous praxes of art, technology, and learning that are both grounded by and support the theories proposed in this research.

For my late father, Martin E. Martinez, Jr.

My gardener, teacher, hunter and dreamer



Thank you for teaching me about the sky, the water, the plants,

The land and its peoples, and the animals —

Especially the deer and fish of our beloved home

Thank you for teaching me about life, respect, and our culture,

And for knowing me better than anyone



The achievement of this dissertation is just as much yours as it is mine.

It was our dream.

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PREFACE

The contents of the chapters in this dissertation are original, unpublished, independent works by the author, C. Martínez, excepting National Science Foundation sponsored academic research, excerpts from a National Science Foundation Final Report, artist statements, the photo documentation of artifacts, and the artifacts themselves that are featured via photo documentations. All of these exceptions are collaborative work co-published and co-created by members of various artist and technology collectives (including an academic research group) within whom the author is a stakeholder or member of, and contributing collaborator.

None of the images published in this essay are reproductions of legally copyrighted materials. The author of this dissertation is the joint author and stakeholder of all the images and artist statements exhibited in this dissertation. All the collaborating authors of these materials are cited and credited in accordance with MLA standards.

Chapter 5.7 and most of Chapter 6 of this dissertation are based on experimental research funded by the National Science Foundation Computing Education for the 21st Century (CE 21) Grant (#1150150), proposal title “E2textiles: Electronic Textile Designs for American Indian Youth, Communities and Pre-service Teacher Education.” This research is a collaboration that includes my academic lead co-chair Professor Bryan Brayboy from Arizona State University, as well as Professor Yasmin Kafai and doctoral candidate Kristin Searle from University of Pennsylvania.

The research associated with grant NSF CE 21 #1150150 involves human subjects research, and was conducted in compliance with research protocol (IRB

#1212008630), approved by the Arizona State University's Institutional Review Board, and research protocol (IRB #817066), approved by University of Pennsylvania's Institutional Review Board. This research was also conducted in compliance with a memorandum of understanding professional development grant agreement and a non-disclosure agreement between Arizona State University, Center for Indian Education, and a non-disclosed Arizona Native American community.

All of the research presented in this dissertation is in compliance with research protocols IRB #1212008630 and IRB #817066, as well as the memorandum of understanding and non-disclosure agreements between Arizona State University, University of Pennsylvania, and the non-disclosed Arizona Native American community. All the IRB protocols for this research, including the memorandum of understanding and non-disclosure agreements are on record at the Arizona State University Office of Research Integrity, and are filed under IRB #1212008630.

Chapter 5.7 titled "Learning: Building Critical Media and Digital Literacies Capacities," uses text provided in the final report compiled for the National Science Foundation Computing Education for the 21st Century (CE 21) Grant (#1150150). The purpose of this text is to provide a general overview of the digital media and learning research at an Arizona Native American community. The excerpts of the final grant report that are presented in this research are compiled from texts by principal investigators Bryan Brayboy and Yasmin Kafai, as well as co-principal investigators Christopher / Cristóbal Martínez and Kristin Searle. All these authors are properly cited and credited in accordance with MLA guidelines.

CHAPTER 1

POINT OF ENTRY

Introduction

This dissertation extends theories of media and indigenous sovereignty by examining how diverse indigenous designs and practices of media technologies constitute self-determination, as well as how media/technological exercises of self-determination operationalize indigenous sovereignty — phenomena referred to in this research as Indigenous Technological Sovereignty or Tecno-Sovereignty. Although this research extends a system of theories broadly responsive to indigenous nation building within the United States and Canada, its purpose is to address North American indigenous peoples, as well as to reach towards diverse indigenous peoples throughout the world.

This dissertation theorizes Tecno-Sovereignty and examines its emergence from cross-cultural and inter-cultural indigenous innovations convolved from new emerging digital media, old electronic analog media, and traditional indigenous media. This dynamic convergence can be described as grounded by what North American indigenous education scholars refer to as indigenous knowledge and indigenous knowledge systems (Barnhardt and Kawagley; Battiste; Cajete, “The Struggle and Renaissance in Indigenous Knowledge;” Castagno and Brayboy; Kawagley; Sefa-Dei).

In a report prepared by scholar Marie Battiste, for the Minister of Indian Affairs of the Indian and Northern Affairs Canada, a growing number of research inquiries are striving to shed light on indigenous knowledge in education (3). In her report “Indigenous Knowledge and Pedagogy in First Nations Education: A Literature Review with

Recommendations,” Battiste highlights concepts describing indigenous knowledge while underscoring the challenges associated to achieving the equitable inclusion of indigenous knowledge in formal education. Some of the concepts Battiste uses to help describe indigenous knowledge are: “local knowledge or wisdom;” “indigenous technical knowledge;” “traditional ecological knowledge;” and “traditional knowledge. (7)” Battiste argues that indigenous knowledge is systemic to indigenous communities, and that it is embodied by groups within both rural and urban spaces (7).

Although indigenous peoples use indigenous knowledge systems to create new inventions as well as to maintain robust technologies, this indigenous media may not be perceived as technology. During a panel at the 2014 Digital Media Learning Conference, Martínez, Brayboy, Searle, and Kafai reported research in a Native American community where members often perceived indigenous innovations that derive from applied indigenous knowledge as traditional phenomena, and therefore labeled “traditional.” In this same community, these researchers also reported that digital media and learning students defined their own digital media innovations as technological, but clarified that they did not view their electronic innovations as part of their culture because they perceived technology as something that lies beyond the boundaries of their traditions.

Tecno-Sovereignty complicates colonial and indigenous cultural models by which concepts of tradition and technology are diametrically framed as opposites. Tecno-Sovereignty hypothesizes that technical knowledge and technologies by indigenous peoples are part of what indigenous knowledge systems and education scholars Bryan Brayboy and Marie Battiste describe as indigenous knowledge systems (Battiste 10;

Brayboy, “Indigenous Knowledge Systems”; Brayboy, “Ethnography Forum”). In a Fall 2009 course lecture, Brayboy described these systems as continuously emerging from cumulative place-based dynamic knowledge networks grounded by a long-view history of human experiences. These emergent tried and tested indigenous knowledge systems have been handed down from generation to generation, and are the science by which indigenous innovations are grounded (Cajete 87; Castagno and Brayboy 732, 737-739).

Within the context of place, indigenous technologies mediate relationships, complicate understanding, reinforce values, facilitate meaning-making, and perform work, all of which facilitates diverse ways of being and knowing amongst today’s indigenous peoples (Kawagley 49-74; Barnhardt and Kawagley 9-20). This research operates under the assumption and belief that indigenous peoples are emergent like all other peoples on earth, and are not relics of the past as often stereotyped by science, governments, museums, and cinema.

Tecno-Sovereignty currently struggles to impact normative perceptions of technology within the contexts of colonization, imperialism, and globalization. Research indicates that normative concepts of technology are complex and shifting according to multiple competing values. For the purposes of considering mainstream concepts of technology in relation to indigenous knowledge systems and innovations, the following paragraph presents one example of the many value systems contributing toward a basic perception of technology maintaining today’s status quo.

According to technology marketing scholar Robert Kozinets, a common philosophy of technology is the Western utopian concept that technology equals human

progress (Kozinets 869). In other words, this societal doctrine assumes applied science is a moral endeavor, predicating notions of human improvement upon advancing technologies. Despite tremendous evidence to the contrary (e.g. technological disasters throughout human history), “techtopian” inspired values of technology continue to pervade societal thought.

As a consequence of utopian philosophies of progress, technology is often perceived as the latest invention placed on the market (McOmber, 143-144). Utopian values highlight one of many innovation frameworks that derive from imperial and colonial systems of knowledge. Like innovation emerges from value systems driven by concepts such as utopia, theories of indigenous Tecno-Sovereignty suggest that innovation frameworks also derive from values driven by indigenous knowledge systems.

Indigenous studies scholars argue that indigenous knowledge systems are often tied to the situated relationships between peoples and the biomes they inhabit (Basso 106-111; Battiste 13; Oliveira 110-115). As cited earlier, Battiste and other scholars describe indigenous knowledge systems as embodied by diverse indigenous groups of people, having cumulatively emerged over long periods of time. In other words, indigenous knowledge systems emerge from place-based ancestral knowledge legacies that have been passed down from generation to generation since time immemorial.

During a panel presentation at the 2014 University of Pennsylvania Ethnography Forum, Brayboy further clarifies indigenous knowledge systems by describing them as not only localized knowledge content and wisdom, but also as a socio-cultural embodiment of a people’s worldview. He describes indigenous knowledge systems as

defined by ways of being (ontology), ways of interacting with the world or ways of knowing (epistemology), and notions of aesthetics (axiology). Brayboy argues that the embodiment of ontologies, epistemologies, and axiologies by indigenous peoples, in relation to lands and natural biomes, leads to diverse societal understandings of what is “good, beautiful, and true.” Brayboy’s definition implies that indigenous knowledge systems are dynamic, diverse, emergent, site-specific, and that they circulate.

In this research, theories and evidence of Tecno-Sovereignty presuppose that indigenous peoples re-imagine foreign inspired pervasive technologies by repositioning these tools in accordance with the logic of indigenous knowledge systems. This research specifically examines the indigenous salvaging, hacking, and modification of foreign technologies for the innovation of potentially diverse indigenous forms of culturally sensible and responsive media. The innovation frameworks explicated in this research support Brayboy’s theory that indigenous knowledge systems are not static and that they continuously adapt to changing environments.

In this dissertation, media from art, technology, and learning are exhibited as worked examples. In addition to theory-making, this research exhibits a series of what Digital Media and Learning scholar James Paul Gee calls “worked examples”— exemplars that put “good work” to the test of real users’ goals and inclinations within the crucible of given situations’ affordances and constraints (*New Digital Media* 40-52). The worked examples exhibited in this dissertation potentially model Tecno-Sovereignty.

Because worked examples are actions that have not yet endured the rigors of critique, it is difficult to know at this time if the “worked examples” exhibited in this

research are in fact useful to indigenous peoples. For now these examples are the work of indigenous intercultural artist and technology collectives, and not greater indigenous communities such as tribes. For the time being, I argue that these established worked examples offer models toward a vision of Tecno-Sovereignty. However, it will ultimately be indigenous communities themselves who will determine the value of these models.

Within the exhibition of worked examples offered in this research, hacking and modification is an exercise of indigenous self-determination, which is the repositioning of foreign virtual and physical material through re-designs and re-imagined uses of these virtual and physical mediums and media. This functional and aesthetic design and re-positioning of medium and media, in accordance with an indigenous people's local place-based values, defines the concept of indigenous salvaging, hacking, and modifying.

The theories and praxes of this research explicate how localized practices of indigenous convolution media derive from place-based methodologies and methods for the salvage, hacking, and modification of media. I define indigenous convolution media as the site where new emerging digital media/technology, old electronic media/technology, and indigenous traditional ceremonial media are traversed by indigenous designer-users in order to operationalize indigenous sovereignty, which are emancipatory outcomes responding to the needs and desires of a given community.

Expressions of Tecno-Sovereignty struggle to exist under broad ranging conditions of colonization and neo-liberalism. These conditions include emerging globally networked media technologies of increasing velocities. The worked examples presented in this dissertation are experiential media designs representing efforts by

indigenous peoples to rationalize, in accordance with their own worldviews and self-determination, the rapid changes forced by emerging media technologies. This evidence demonstrates that there are indigenous collectives creating tools and uses for tools that help to operationalize their collective sovereignty. This nod towards Tecno-Sovereignty is not unlike indigenous innovations stemming from pragmatic appropriations and resourceful adaptations of foreign material culture, which have been tactically and unapologetically deployed by indigenous peoples from around the world to resist colonization and the assimilating global market systems that threaten indigenous sovereignty (Bright 583-605; Kawagley 66-69; Martinussen 1-3; Müller, “An Other Path” 235-257; Nango and Thoresen 1-5; Oskal 1-5; Ruuska 586-597).

Tecno-Sovereignty struggles to emerge under the conditions of military-industrial developments of electronic media propagated by expanding global market-systems. Diversity reports such as Google’s “Making Google a workplace for everyone,” which parallel reports throughout the tech industry, suggest corporations and education have left indigenous peoples, diverse peoples throughout the western and eastern hemispheres, out of ideation dialogues that focus on the development of emerging media technologies. Although these innovation spaces are exclusionary, their outcomes are impacting the world’s population with pervasive changes within multiple sectors of power.

In response to the erasure of indigenous peoples from globally consequential innovation dialogues and ideation processes, indigenous peoples throughout the world are struggling to operationalize Tecno-Sovereignty under rapid cultural changes catalyzed by increasingly ubiquitous digital network technologies. As networked economic

stakeholders (in some cases also including indigenous groups) strive to diversify access to emerging media technologies, many indigenous peoples are also working to diversify innovation dialogues that reflect their diverse values and enhance their abilities to exercise self-determination in a world requiring greater resiliency.

Much like the global establishment of literacy (reading and writing), emerging media technologies will not vanish, but instead are projected to proliferate societies and become ever more pervasive within the everyday lived experiences of human beings. It is under these conditions that Tecno-Sovereignty must respond by first prompting the question: If the presence of emerging media technologies will only continue to increase, what do indigenous peoples want from these technologies? Indigenous rhetorician Scott Richard Lyons inspires this question as he asks a similar question about an older colonial medium — reading and writing (“Rhetorical Sovereignty” 447).

Tecno-Sovereignty extends existing theories of indigenous sovereignty and theories of media because emerging media technologies advance real-time power systems that authenticate sovereignty. Examples of these sites of power include: sociocultural networks; communities of interest, learning communities, collaborations, corporations, government, weapons, games, ceremony, knowledge, medicine, economies, resources, rhetoric, time-space, places, aesthetics, simulations, and so on (Bratton).

Despite the central relevance of emerging media technologies to Tecno-Sovereignty, canonical media theory generally does not realize inquiries of media by indigenous peoples. Furthermore, media theory stems from Western traditions, which are ontologically and epistemologically constrained in their ability to reflect indigenous

values and perspectives. To address these limitations, the first section of this research presents new theories of media grounded by Western-centric media theory and indigenous knowledge systems in order to postulate Tecno-Sovereignty. This connected-knowledge approach to theory-making reflects an indigenous research methodology valuing diverse and what are sometimes rival perspectives.

This research includes, as mentioned earlier, the exhibition of indigenous intermedia by indigenous artist and technology collectives. These innovations include indigenous designs, installations, and performances of indigenous convolution media that underpin theories of Tecno-Sovereignty. The work presented in this series of essays demonstrates indigenous designs for digital media learning, cultural repatriation and production, indigenous entrepreneurship, building local publics, building public memory, diplomacy, and critical rhetorics that engage public spheres — all of which are tactical exercises of self-determination via technologies bearing intercultural indigenous values.

The research methods that I use for theorizing Tecno-Sovereignty are: literature reviews of published texts, discourse analyses of media, an exhibition of published media by indigenous art and technology collectives, ethnographic observations and interviews from digital media learning research in a Native American community, personal testimonies concerning the logic of my mestizo position, and personal testimonies as a member of the collectives highlighted in this research.

This research presents theories that predict indigenous technological sovereignty and highlights the work of intercultural North American indigenous art and technology collectives relative to my mestizo position and as a member of these collectives.

Although this position hardly reflects the diversity of indigenous peoples throughout the world, or even North America for that matter, the purpose of this research is to contribute a highly focused reference point to support inclusive dialogues about indigenous media practices and their complex relationships to indigenous sovereignty.

Tecno-Sovereignty is struggling to emerge in a world defined by technologies that are becoming so fast that human decision-making is becoming too slow to keep up, and is thus replaced by automated decision making mechanisms based upon ultra-fast feature extraction algorithms used to underpin global capitalism, cinematic weapons systems, and high-definition all encompassing government surveillance programs (Deluse and Guitari; “Simulacra and Simulation;” “Speed and Politics;” “War and Cinema”). To make matters more challenging, indigenous Tecno-Sovereignty also struggles to exist in a world of increasing competition for natural resources as the population continues to expand while the earth grows warmer.

Although the theories and working examples presented in this dissertation are evidence of various potential models for the operationalization of Tecno-Sovereignty. The growth of indigenous sovereignty is currently impeded by a digital divide, where for example, the FCC Native Nations Consultation and Policy currently reports on their website that there continues to be a lack of access to broadband networked communications infrastructure extending towards and from the geographies of many indigenous populations in the United States. Furthermore, there is a lack of culturally responsive digital and critical media literacies learning within indigenous communities (Margolis et al; Kafai et al., “Ethnocomputing” 241).

These disparities are examples, in the United States, resulting from global market systems and jurisdictional issues associated with the federal recognition of indigenous sovereignty, that impede the capacities of corporations, whether indigenous or non-indigenous, to serve small and sometimes remote economies of scale (King 141, 156). The lack of both infrastructure and indigenous digital media literacies pedagogy provide challenges that hinder the building of capacities necessary to operationalize Techno-Sovereignty, which has social, political, cultural, and economic implications that impact the health and wellness of peoples (“Telecommunications Technology and Native Americans”).

Statement of The Problem

The central purpose of this research is to understand the potential of indigenous convolution media¹ for the exercise of indigenous self-determination and sovereignty within the context of today's advancing velocities and precision, which are defining and defined by technologies such as: electronically mediated global market systems, high speed communications networks, smartphones, artificially intelligent weapons systems, video games, online social networks, surveillance systems, feature extraction algorithms, robotics, and experiential interactive media.

To extend and complicate scholarship on indigenous sovereignty, media theory, art, culture, politics, law, education, and capitalism, this dissertation presents theories of Tecno-Sovereignty to: lay the groundwork for a discourse on indigenous technological sovereignty; challenge indigenous peoples to shape shift networked electronic media technologies in ways that are self-determined and culturally-responsive; argue a set of reasons why the indigenous innovation of advancing media technologies is necessary for self-determination and sovereignty; and consider the implications of networked electronic media as a practice of indigenous self-determination.

To support the theories posed in this research, a series of designs, constructions, and uses of indigenous convolution media by indigenous art and technology collectives are exhibited as “worked examples,”—exemplars that put “good work” to the test of real users’ goals and inclinations within the crucible of given situations’ affordances and constraints (“Worked Examples” 44-52). The affordances and constraints identified by

¹ I define indigenous convolution media as the site where new emerging digital media/technology, old electronic media/technology, and indigenous traditional ceremonial media converge.

this research are largely determined by the contexts of capitalism and colonization in relation to the intentions of indigenous collaborative groups identified in this dissertation, which are to: offer social, political, and economic critiques; model a vision of self-determination that may be useful for the sovereignty of indigenous communities; and, quoting the online artist statement by indigenous artist collective Postcommodity, “. . . connect Indigenous narratives of cultural self-determination with the broader public sphere. (“About”)” In addition to exhibiting worked examples, this research provides a context for these “examples as evidence,” which support theories in this research that define early concepts of Tecno-Sovereignty.

The exhibition of “worked examples” in this dissertation is qualitative research based on observational, interview, photo-visual, video-visual, and textual data. The data-collection for the examples presented in this research was conducted in museums, galleries, the Internet, and library archives, as well as at an Arizona Native American community charter school and a community college situated on this Arizona Native American community’s lands.

All of the observations in this dissertation derive from research in multi-media archives of published and of publically exhibited works, as well as direct ethnographic observations and research participant interviews from IRB approved research, which my colleagues and I coordinated at the aforementioned locations. In terms of data collection, all of the interviews were conducted using a face-to-face format, which included audio/video recordings of these interviews for later analysis. Indigenous methodological implementations of these data-collecting techniques form the body of this research.

In this research, I used an indigenous research methodologies approach to data collection. One of the central tenets of indigenous research methodologies is to produce research outcomes that are the result of co-intentional collaborative research, as well as for the researcher to produce outcomes that are beneficial to the peoples who are tied to the research (Brayboy et al. 423-424; Lomawaima 1-2; L.T. Smith 107-141; Tuck 423-424; Wilson 12-21). In the case of this dissertation, I applied indigenous research methodologies by: contributing to the co-intentional production of the “worked examples” featured in this research; extending and complicating the discourse projected by the “worked examples” (in this case artifacts) themselves; and producing research outcomes that potentially contribute towards the knowledge and practices of indigenous peoples in ways that benefit indigenous self-determination.

This research posits that the indigenous salvaging, hacking, and modification of mediums and media (both physical and virtual) through extemporaneous design; design-after-design; and adaptive re-use gives rise to disruptive innovations that produce momentary fissures during which indigenous peoples mitigate colonization through the recovery and creation of meanings and knowledge. Through an indigenous lens, this dissertation articulates practices of indigenous convolution media that develop and commend tools by which all peoples may consider the implications of the Digital Age and technology on how we view ourselves, each other, relationships, terms of engagement, and the places we inhabit.

Investigative Purpose

Sovereignty is a complex topic by which thousands of documents, both legal and scholarly, having been written to interpret, shape, and animate its meaning. According to the Online Etymology Dictionary, the term “Sovereignty” derives from the mid 14th century Anglo-French word *sovereynete*, and Old French *souverainete*. The meanings of these terms are “authority, rule, supremacy of power or rank,” which derive from the Old French word *soverain*, whose etymological history dates back to the late 13th century and evolving from a noun to an adjective in the early 14th century.

As a noun, *soverain*, known to us in English today as *sovereign* is defined as “superior, ruler, or master,” which derives from the idea of a “lord,” as in a ruler whose authority is granted by divine right. Over time, the term sovereignty, evolved to its current definition, which according to the Merriam Webster Dictionary, is (a.) the unlimited power over a country, and (b.) a country’s independent authority and right to govern itself.

Concepts of sovereignty originated in Europe during the decline of the European feudal systems in the late 14th century and at this time, according to the online etymology dictionary, it was recorded to mean “authority” and “rule.” The etymology dictionary states that by 1715, the word sovereignty had taken on the meaning “existence as an independent state.” Under this meaning, it later spread throughout the world as a result of colonization, and its definition had remained relatively stable until the mid 19th century.

By the mid 19th century, the meaning of the word “sovereignty” became largely contested by indigenous peoples in the United States after the federal government and

Native American tribes began to test the legitimacy of the term, particularly as to how it applies, in a court of law, to Native American Nations. Since the mid 19th century, the term has been continuously appropriated and reimagined by indigenous peoples for the purposes of indigenous nation building.

Because of violence and disease epidemics associated to European imperialism and colonization, indigenous peoples have had to diplomatically interface with imperial power through European concepts of sovereignty (Alfred, “Sovereignty” 44). Over time, many indigenous peoples such as Native Americans and First Nations Peoples in North America have appropriated concepts of sovereignty, and operationalized their own indigenous forms of sovereignty through exercises of indigenous self-determination as they work toward nation-building (Deloria Jr., *We talk* 60, 110-111, 114-137; Deloria Jr., *Custer Died*; Alfred, “Sovereignty”).

In the United States, concepts of indigenous nationhood in relation to sovereignty, in part, stem from treaties between tribal groups and the federal government. At the time the treaties were signed, emerging colonial nations, after having gained their independence from European countries, recognized indigenous tribes as nations (Wilkins 42). During the signing of treaties, the U.S., for example, legitimized its sovereignty by recognizing indigenous tribes as nations — sovereignty being a power that required treaties with other nations (Alfred, “Sovereignty” 34, Wilkins 47). It was from signing these treaties, breaking treaties, and through military force that the United States invoked nationhood (Deloria Jr., *Custer Died* 28-53). According to indigenous sovereignty scholars, Taiaiake Alfred and David Wilkins the legitimating practice of making treaties

not only occurred after the American Revolution, but that this practice was a tradition stemming back to many of the earliest interactions with European nations and “indigenous nations,” by which European and indigenous nations signed treaties (Alfred, “Sovereignty” 34; Wilkins 47). In these cases European nations signed treaties to legitimize their sovereignty in the Western Hemisphere with the “. . . original governors and occupiers of North America” (Alfred, “Sovereignty” 34).

In terms of newly forming countries, such as the U.S., this legitimating strategy was a necessity, since endorsements by European nations from which it gained independence were not diplomatically possible after revolutions had taken place. Over time, Native American tribes for example, have reminded the United States federal government of their treaty status as nations, as well as their intentions to also use the treaties to operationalize their own national sovereignty. Indigenous nation building reflects the inherent desire of Native sovereigns to resist assimilation. In addition to inherent desire is the assertion by indigenous peoples, that sovereignty was not granted to indigenous peoples through treaties, but that sovereignty is the “original and inherent power” of indigenous peoples, and that this inherent power was originally recognized by European nations (Wilkins 48). Because of this history, the inherent sovereignty of first peoples, and tactical choices by Native American tribes, Native sovereignty is differentiated from civil rights. The goal of indigenous sovereignty is nation building, while civil rights movements stem from peoples’ desires for assimilation based on doctrines of racial equality (Deloria Jr., *We Talk*; Wilkins 41-62).

Because sovereignty derives from a European worldview and is a conceptual framework that has been used to suppress indigenous nationhood, the indigenous peoples of North America have, since the beginning of the self-determination era, questioned the capacity of state sovereignty² to express indigenous concepts of governance and support indigenous nationhood (Alfred, “Sovereignty” 36-40). Furthermore, on a philosophical level, state sovereignty has been questioned from the moment indigenous peoples in North America encountered it (33).

At the same time indigenous nations have critiqued concepts of sovereignty by colonial nation-states as having given rise to unjust systems of governance used to violently subjugate indigenous peoples. Through indigenous discourses, it has become clear that re-imagining and re-positioning the European concept of sovereignty is necessary to produce new concepts for indigenous self-governance. The purpose of indigenous sovereignty is to create indigenous forms of governance, identity, and discourses dis-entrenched from federal and state legal structures (Alfred, Wasáse 209).

Scholars and legal practitioners have recently diversified notions of sovereignty with theories of indigenous sovereignty. These concepts include: native sovereignty, cultural sovereignty, rhetorical sovereignty, indigenous entrepreneurship, food sovereignty, and visual sovereignty (Alfred, “Sovereignty;” Coffey and Tsosie, “Rethinking Tribal Sovereignty;” Lyons, “Rhetorical Sovereignty;” Miller, *Reservation Capitalism*; McMullen, “Regenerating Indigenous Health”; Wilson et al., “Indigenous Media”). The purpose for these frameworks is to conceptualize, understand, and

² State sovereignty refers to notions of sovereignty via governments that were established by settler-colonial societies in North America.

operationalize indigenous sovereignty through indigenous self-determination in relation to colonization, nation-states, and market systems.

At its most basic level, indigenous sovereignty is defined as an indigenous group's right to self-governance without external interference, along with the ability of sovereign communities to empower agreements with other nations or communities as it sees fit (Deloria Jr., *We Talk* 118-119). This basic definition is identical to the European definition of sovereignty, as well as Miriam Webster's definition, however, the indigenous philosophies for how this definition is operationalized is what differentiates "Native" sovereignty from European sovereignty. Furthermore, Wilkins complicates this basic definition by clarifying that this fundamental notion of autonomy does not, and cannot exist for any group within today's world of interdependencies created by networked communications and market systems (47).

First nations scholar Taiaiake Alfred provides a foundational theoretical framework for indigenous sovereignty, which he refers to as Native sovereignty (Alfred, "Sovereignty" 39-40). Alfred's perspective is that imperial state sovereignty in North America has obscured justice in favor of advancing the colonial project. He argues, with historical evidence, that state sovereignty moves beyond legal frameworks, by further leveraging power through economic and intellectual strategies (35-36). Alfred also argues that the plurality of peoples in North America are also obscured because there exists only but a few state sanctioned frameworks of sovereignty, largely framed by colonial discourses by which everyone is forced to conform to, and thus limiting and normalizing the way diverse populations throughout continent think about their existences (33-34).

After generations of efforts by indigenous peoples to preserve their cultures and independence, by the 1980s, federal governments in the United States and Canada had failed to fully recognize the sovereignty of indigenous nations and had significantly diminished tribal government power (36). Despite these losses it is important to note the resilience of the indigenous peoples of North America to survive the development of two industrial nations whose explicit goals were to eradicate them.

Responding to legal and political assaults on indigenous sovereignty, both legal scholars and lawmakers began to deconstruct systems of colonial power in an effort to formulate new indigenous strategies by which indigenous peoples could resist the further erosion of their power. According to Alfred, two important strategies emerged from this project, which he argues are both interwoven. The strategies are “the assertion of a prior and co-existing sovereignty,” and “the assertion of a right of self-determination for indigenous peoples in international law. (37)”

These strategies would eventually lead to new international indigenous relationships, with peoples around the world working together to demand that their human rights be respected. These rights include indigenous peoples’ right to exercise their own self-determination, a power that comes from persistent indigenous efforts, needs, and desires to revitalize their communities. Alfred refers to this self-determination as giving rise to “Native Sovereignty,” which “ — is founded on an ideology of indigenous nationalism and a rejection of the models of government rooted in European cultural values” (40).

While Alfred has concluded that sovereignty is ultimately not an appropriate framework for indigenous governance and self-determination, he concedes a rival perspective that indigenous sovereignty has been good for indigenous peoples, and that its positive impact “cannot be understated” (38-39, 41). Through sovereignty, indigenous peoples have achieved “legal and political gains towards reconstructing their individual, collective and social identities,” and through these gains have increased their “mental, physical, and emotional health” (39). Alfred argues that despite these gains, nation-state recognition of indigenous sovereignty as indigenous nations are simultaneously held by the nation state as “domestic dependent nations,” is an oppressive assimilative contradiction that refuses to recognize the inherent rights of indigenous nations (38-40).

Much of Alfred’s analysis and conclusions concerning Native sovereignty are underpinned by the work of David E. Wilkins who is a legal scholar that has written foundational texts on the topic of American Indian Politics. Alfred cites Wilkins’ rigorous research regarding indigenous sovereignty in relation to the U.S. Supreme Court (38). These citations by Alfred highlight Wilkin’s conclusions that the U.S. Supreme Court is implicated in having eroded indigenous sovereignty.

According to Alfred, Wilkins provides his conclusions by demonstrating legal contradictions that reveal weaknesses of indigenous sovereignty under the protection of the U.S., which begin with the Marshall court decisions in the mid 19th century, and that continue to today’s legal philosophies (38). Alfred quotes Wilkins having stated in *American Indian Sovereignty and the U.S. Supreme Court*, that “justices of the supreme court, both individually and collectively have engaged in the manufacturing, redefining,

and burying of ‘principles,’ ‘doctrines,’ and legal ‘truths’ to excuse and legitimize constitutional, treaty, and civil rights violations of tribal nations” (38).

Together Wilkins and indigenous historian K. Tsianina Lomawaima analyze the history of indigenous sovereignty in relationship to the United States federal government. More specifically, Wilkins and Lomawaima provide us with a historical account and analysis of legal proceedings involving the U.S. federal government and tribal nations that has shaped what they refer to as the “trust doctrine” (64-97). Legal scholars Wallace Coffey and Rebecca Tsosie succinctly define the trust doctrine relationship between the U.S. federal government and indigenous nations as “a vision of tribal sovereignty recognized by federal governments as essentially autonomous, although subject to an overriding federal authority” (3). In other words the sovereignty of Native Americans and their lands/resources are held “in trust” by the U.S. federal government.

A “trust doctrine” approach by the federal government toward tribal nations was first initiated by Chief Justice John Marshall in a series of court cases in the mid 19th century, during which time include the prohibition, by the federal government, of Native Americans from exercising public transactions concerning ownership over their lands (Wilkins and Lomawaima 68).

During court cases of the mid 19th century, involving Native American nations, Marshall began to lay the foundations for a paternalistic legal framework empowering the U.S. federal government as the “trustee” of Native American lands and resources. Wilkins and Lomawaima, quote Marshall, in *Cherokee Nation v. Georgia* (1831), who states that tribal nations are not foreign nations, but “more correctly, perhaps, be

denominated domestic, dependent nations,” as he further explains is a relationship, quoted by Wilkins and Lomawaima, whose “relation to the United States represent that of a ward to his guardian” (68). From this framework, anti-trust theories posit that indigenous perspectives about the “trust doctrine” relationship have largely been ignored and erased, leaving tribes vulnerable to every whim of U.S. federal authority (69-71, 78).

The foundational concept of Native American nations as “domestic dependent nations” by Marshall has lead to a great deal of ambiguity in that, according to native scholar Vine Deloria Jr., it has failed to produce a concrete and mutually “agreed-upon” legal framework defining the trust relationship between tribes and the federal government (Deloria Jr., *Custer Died* 31). Because of this lack of definition, the federal definition of sovereignty remains slippery, unstable, and susceptible to ongoing reinterpretations by changing presidential administrations, as well as judicial, and congressional politics (28-53; Wilkins and Lomawaima 66-67).

The ambiguity of the trust doctrine is evident in the various terms, highlighted by Wilkins and Lomawaima, which have been used in a court of law to refer to the trust relationship between American Indian nations and the federal government. These terms include: “trust, trust doctrine, trust duty, trust relationship, trust responsibility, trust obligation, trust analogy, ward-guardian, and beneficiary-trustee” (65). An analysis of the usage of these terms has led to questions regarding the federal government’s intentions. Questions regarding the federal government’s intentions stem from the following basic question: Is the trust doctrine designed by the federal government to protect indigenous nations, or is it designed to control them?

Wilkins and Lomawaima review both anti-trust and pro-trust theories, as well as legal frameworks that question whether or not a trust doctrine is a legitimate legal principle, or if it is just simply a moral construction at best (in cases when the sovereignty of tribes is protected). Unfortunately there is overwhelming legal evidence demonstrating the federal government abusing its trust powers, and that its paternal decisions amount to a history of federal exercises that lack tribal consent, which have been initiated to the detriment of indigenous tribes in favor of federal and white people's interests (Wilkins and Lomawaima). In one case study of these abuses, Wilkins and Lomawaima demonstrate the failure of "trust" by federal government, allowing the State of Georgia to act without restraint in violating the sovereignty of the Cherokee nation, resulting in land and resource grabs while leaving indigenous peoples with no legal protections from violence and no legal rights by which to defend themselves and their assets (82).

Despite a history of the federal government breaking its treaties with indigenous nations, the United States has also demonstrated, through legal documents and proceedings, that it does continue to believe in what Wilkins and Lomawaima refer to as the "validity and sanctity of Indian treaties and agreements," and that it has demonstrated an ability to satisfy its ongoing legal agreements with Native American nations. These scholars cite that the evidence of their claim is backed by federal government implementations of "federal policies that affirm a nation-to-nation relationship; federal laws that support Indian religious freedom, tribal self-governance, and tribal judicial systems; judicial decrees that recognize the *inherent* sovereignty of tribes; and presidential actions that carve out a path of positive intergovernmental relations" (93).

Acts of abuse by imperial nations, good faith opportunities negotiated by indigenous peoples with federal governments, and indigenous desires all have led to various conceptual explorations of sovereignty. Historical narratives of indigenous sovereignty span well beyond North America, and within North America itself, and are far more complicated than the basic information presented in the previous paragraphs of this literature review. However, with this review of literature I hope to illustrate a brief strand of exigencies by which those who are unfamiliar with indigenous sovereignty can begin to identify and understand acts of colonization that catalyze the need for indigenous self-determination and sovereignty. Furthermore, I have chosen to present this narrative thread to provide a context for the reasons why sovereignty is philosophized by scholars, and to briefly survey the indigenous sovereignty theories and frameworks articulated by scholars and practitioners of various disciplines. Not only does this review of literature provide a context for this research, but it also serves to justify the purposes of this research whose aim is to fill a gap in the current corpus of knowledge concerning indigenous sovereignty. This effort comes with the hope that the theories herein contribute a useful perspective toward indigenous cultural emergences in connection with the ongoing “process-centered understanding of sovereignty” (Coffey and Tsosie 8).

Former Chairman of the Comanche tribe Wallace Coffey and Native legal scholar Rebecca Tsosie have articulated one of the fundamental characteristics of indigenous sovereignty called cultural sovereignty. This aspect of indigenous sovereignty was cogently articulated by Coffey as “the heart and soul that you have, and no one has jurisdiction over that but God” (1). Here Coffey is articulating a philosophy of inherent

sovereignty that asserts that, for example, if a tribe continues traditional practices, such as practicing indigenous ceremonies, regardless of colonial actions, the people will continue to maintain their inherent sovereignty and dignity.

More specifically, Coffey and Tsosie define cultural sovereignty as “the effort of Indian nations and Indian people to exercise their own norms and values in structuring their collective futures. ... The concept of "sovereignty" evokes group autonomy, affirming the notion that the tribal community is the locus of cultural sovereignty” (1). Through this definition, Coffey and Tsosie call for the reevaluation of tribal sovereignty doctrine by identifying and applying the indigenous values that are inspired by cultural sovereignty towards indigenous legal frameworks of sovereignty.

To further articulate the variables by which indigenous cultures generally emerge, they quote Native American poet-scholar Simon Ortiz who articulates that indigenous life-ways stem from indigenous aesthetics, languages, traditions, communities, and lands (8). Cultural sovereignty is further extended by Deloria Jr. who asserts that cultures are what provide the foundational knowledge that define the desires, hope, and expectations of a group, and that any power that forces a group to conform to a foreign pattern of thought is violating that group’s sovereignty (*We Talk* 134).

An example of one cultural group violating another group’s sovereignty was the forcing, by the U.S. federal government, of American Indian children to attend boarding schools. The purpose for this use of force by the federal government was never more succinctly articulated than when Captain Richard C. Pratt, founder of the Carlisle Indian

boarding school communicated the purpose of boarding school education, which was to “kill the Indian, and save the man. (Brayboy, “Tribal Critical Race Theory” 430)”

These intentions by the boarding school educational system were built on colonial motives to assimilate indigenous people by systematically destroying their culture. In the case of boarding schools, literacy (reading and writing) was weaponized in order to destroy indigenous languages and linguistic communities, as well as to assault indigenous oral literacies. Unfortunately as a result of colonial beliefs, the historical and long-term implications of boarding schools are devastating (Deloria Jr., “Knowing and Understanding” 42; Lyons, “Rhetorical Sovereignty” 448-449).

Despite the devastation by boarding schools through the establishment of literacy (reading and writing) within indigenous communities in the United States, indigenous rhetoric scholar Scott Richard Lyons provides a framework for sovereignty that repositions literacy away from a damage-centered narrative. In his effort to extend indigenous sovereignty, Lyons poses a critical question: “What do American Indians Want from Reading and Writing” (Lyons, “Rhetorical Sovereignty” 449, 462, 464)? By leveraging the rhetorical aspects of his question, Lyons illustrates the violence and colonial assimilation that took place at the site of reading and writing, and he encourages indigenous peoples to flip the script by appropriating this technology for the purposes of indigenous sovereignty. Implicit in his interpretation of colonization, is the idea that reading and writing is here to stay because it has become entrenched within the sovereignty of indigenous peoples (448-450). By stating the colonial reality of literacy, he then refers back to the utility of his question by answering that indigenous peoples

could operationalize their sovereignty by using reading and writing to assert control over law, pedagogy, and aesthetics (462-467).

Lyons' contribution to dialogues concerning Indigenous sovereignty is his assertion that sovereignty is rhetorical, and that writing can be used to articulate counter narratives of resistance and survival. Lyons argues that this rhetorical sovereignty requires a Native voice ("Rhetorical Sovereignty" 453, 462-463, 466-467).

To build the capacities necessary to articulate concepts like rhetorical sovereignty, indigenous education scholars have also extended indigenous sovereignty, not through the label of education sovereignty, but by articulating the importance of and a vision toward indigenous knowledge systems in education. Concepts of indigenous knowledge systems in education are predicated upon a synthesis of western and indigenous cross-culturally connected frameworks for learning (Barnhardt and Kawagley; Battiste; Brayboy and Castagno; Brayboy and Maughan; Cajete, "The Struggle and Renaissance in Indigenous Knowledge"; Castagno and Brayboy; Kawgley).

The purpose for this movement in education is to support indigenous communities in their efforts to gain control over what sorts of content are valued in indigenous communities as well as the methodologies and methods by which students are taught knowledge and ethics. Indigenous knowledge systems in education is concerned with alarmingly low student performance in schools, and argues that school reforms are necessary to make learning culturally responsive toward indigenous students, this includes mitigating educational legacies of assimilation, which remain tied to colonization, as well as incorporating indigenous knowledge content and ways of

knowing into school curriculums. (Barnhardt and Kawagley; Battiste; Brayboy and Castagno; Brayboy and Maughan; Cajete, “The Struggle and Renaissance in Indigenous Knowledge”; Castagno and Brayboy; Kawgley).

A characteristic of indigenous sovereignty, evidenced in the different aforementioned frameworks is that, and as I stated earlier, aspects of indigenous sovereignty are deeply rooted in resistance. The particular resistance that I am referring to is about protecting land rights, natural resources, political power, and culture, as well as the self-determined integrity of communities. Another concept of indigenous sovereignty focuses on the protection of property, which is referred to by Native American scholar Deborah Harry and Native Hawaiian scholar Le`a Malia Kanehe who posit that domestic and federal Indian law do not have the legal mechanisms in place to protect indigenous properties (27-30). The properties these scholars refer to include all forms of cultural property defined as tangible and intangible, and traditional and contemporary, as well as written and oral (27, 32). Harry and Kanehe argue for sovereign protections of cultural property, which they argue, “. . . is under constant threat from exploitation, theft, misrepresentation, misuse, and commodification,” referring to threats from outside indigenous communities (27, 55).

These scholars argue that indigenous knowledge, genetic material, food systems, and cultural properties, although protected by international organizations like the United Nations and the World Intellectual Property Organization, need to be protected by indigenous laws (46-55). They further argue that infractions against indigenous ownership of cultural property demonstrate that the current systems by external

organizations are inadequate to provide indigenous peoples with the protections they need (27). Despite their critiques Harry and Kanehe explicitly refer to the following definitions of cultural property by quoting UNESCO to explain what must come under indigenous sovereign protection:

“all kinds of literary and artistic works such as music, dance, song, ceremonies, symbols and designs, narratives and poetry; all kinds of scientific, agricultural, technical and ecological knowledge, including cultigens, medicines and the rational use of flora and fauna; human remains; immovable cultural property such as sacred sites, sites of historical significance, and burials; and documentation of indigenous peoples' heritage on film, photographs, videotape, or audiotape” (31).

Within Harry and Kanehe’s framework for “Tribal Sovereignty Over Cultural Property,” there are aspects of culture that include contemporary indigenous media. The final aspect of sovereignty that I present in this literature review is on the topic of indigenous media, largely within a context of visual sovereignty. Indigenous media is defined by Wilson et. al as: “. . . forms of media expression conceptualized, produced, and circulated by indigenous peoples around the globe as vehicles for communication, including cultural preservation, cultural and artistic expression, political self-determination, and cultural sovereignty” (n. pag.). Within this framework of indigenous media is a discourse of the media for the production and distribution of indigenous messages that exercise rhetorical sovereignty — an aspect of what I refer to in this research as Indigenous Technological Sovereignty or Tecno-Sovereignty.

Although there is a growing body of scholarly work on Indigenous Media, a large degree of this scholarship focuses on older media such as film/video and photography while emphasizing visual languages, as well as critiques of camera gaze constructions of

indigenous tropes (Aleiss; Bataille; Hilger; Rollins and O'Connor). According to Wilson et al., an increasing number of scholars such as notable indigenous media scholars Candice Hopkins, Michelle Raheja, and Beverly Singer are extending this discourse to include digital media in relation to indigenous knowledge systems and storytelling. In addition to these indigenous media scholars, there are reports and papers written by indigenous policy makers on the digital divide, as well as a very limited number of scholars who are addressing issues associated with culturally responsive digital media and learning for indigenous youth (Bissell; Hopkins, "Making Things Our Own"; Kafai et al.; Lameman et al.; López; Raheja; Singer; Twist).

Throughout this literature review I have presented an overview of the scholarly frameworks of indigenous sovereignty that are currently circulating among many indigenous peoples throughout the world. Despite this broad ranging system of theories and networked electronic technologies, there remains little research that investigate pervasive digital media as well as other pervasive exogenous mediums in relation to colonization, excepting guns, germs, foreign language, film, and alphabetic texts. Furthermore, there is little inquiry on how indigenous peoples explicitly operationalize forms of sovereignty through their self-determined design and use combinations of: pervasive emerging media and mediums, including computer science; old media and mediums; and indigenous traditional mediums and media. One of the few exceptions to these knowledge gaps is a recently published book of essays titled *Coded Territories*, which begins to address the relationship of digital media and self-determination through convergence practices of electronic media and indigenous knowledge.

In addition to the aforementioned knowledge gaps, there remains a lack of scholarly inquiry regarding indigenous media contextualized by global-market systems and surveillance, both of which carry deep implications for indigenous sovereignty. There currently is no unified indigenous media theory across computer science, physical computing, rhetoric, aesthetics, hacking, and learning, nor is there an indigenous theory of the media about the convergence of indigenous traditional media and pervasive media.

The purpose of this research is to fill these knowledge gaps by providing a rigorous examination of the role of technology in relation to indigenous sovereignty through an indigenous theory and praxis of technology articulated through the salvage, hacking, and modifying of media (referring to media content or the outcomes of tool use) and mediums (referring to tools used to create/modify media content or other mediums). I assert that this research is much needed because notions of sovereignty, in all their complexity, are increasingly mediated and performed through pervasive networked technologies, which are advancing toward ubiquity throughout the world.

Research Hypotheses

Technologies extend human capacities to manipulate facets of a natural and/or built environment. These tools are often used within societies to modify objects, mediate relationships, and facilitate all aspects of culture. In this research, I hypothesize that the designs of tools themselves as objects, virtual or physical, are imbued with the values of designers, and that there are social, political, economic, and aesthetic consequences associated with both the design and use of tools. In other words, the design and utility of all media embody Discourses³ (“Social Linguistics” 150-222; Bratton 17).

Designers encode their values and assumptions into the technologies they architect. Unless a user modifies a design or its intended use, a design will require the user to comply with the values and assumptions it inscribes. User modifications to a design create a talking-back circuit. This powerful communication circuit is produced when users transform themselves from passive users to critical user-designers.

In addition to this hypothesis, two other hypotheses provide sites of inquiry for this research. These are: that emerging networked digital media (characterized by increasing velocities and real-time computing) enacted by governments, corporations, investors, and consumers produce colonizing forces of assimilation; and that indigenous knowledge systems can be applied by indigenous peoples to reinterpret and reposition emerging networked mediums and media as innovations in accordance with diverse geopolitical indigenous values for addressing varying indigenous needs and desires.

³ Social Linguistics scholar James Paul Gee (2011) argues that meaning is determined by what he refers to as “. . . Discourses with a capital ‘D’” that exist within cultures and social groups (151). He describes Discourses as “. . . not just language, and surely not just grammar, but saying (writing)–doing–being–valuing–believing combinations” (151).

Objectives

The following is a list of research objectives for this dissertation that are intended to extend theories and praxes of media and indigenous sovereignty:

1. To build unified theories of media theory and indigenous sovereignty within the contexts of networked global market systems and colonization.
2. To extend and complicate media theory and indigenous sovereignty.
3. To promote a dialogue about media/technology and indigenous sovereignty.
4. To examine the implications of media through New Literacy Studies, New Literacies Studies, and a Tribal Critical Race Theory (Brayboy; Gee).
5. To provide a working definition of “indigenous technological sovereignty” — Tecno-Sovereignty.
6. To argue a set of reasons why indigenous innovations that convolve newly emerging networked digital media, older electronic analog media technologies, and traditional indigenous media are necessary for indigenous self-determination and sovereignty.
7. To challenge indigenous peoples to engage in practices of shape-shifting pervasive media and newly emerging networked technologies (such as high speed communications and information technology) as exercises of self-determination, which include: building digital literacies capacities; building critical media literacies capacities that include technology ethics protocols, positioning media as rhetorics of public engagement; hacking pervasive exogenous tools in order to address local community needs and desires; and

creating re-imagined ceremonies that attempt to rationalize the ever increasing velocities and precision of newly emerging technologies.

8. To consider the implications regarding the appropriation, shape-shifting, and re-positioning of pervasive media (both physical and virtual) through salvage, hacking and modifying media.
9. To study how convergence culture (the collision of old and new media) extends to indigenous convolution media⁴ (Jenkins).
10. To highlight the phenomena of newly emerging networked media by indigenous peoples as a ground for indigenous re-imagined ceremony.
11. To make capacity-building recommendations for Tecno-Sovereignty.
12. To answer the following five questions:
 - a.) What is Tecno-Sovereignty?
 - b.) What is the importance of Tecno-Sovereignty?
 - c.) How is Tecno-Sovereignty operationalized?
 - d.) What are some examples of Tecno-Sovereignty?
 - e.) What are the capacities required to operationalize Tecno-Sovereignty?

The following is a list of curatorial objectives in this research that are designed to extend and complicate theories and praxes in the field of contemporary rhetoric:

1. Within the topic of the “Rhetoric of Place and Spaces”
 - a.) Arguing the material/ephemeral nature of intermedia as rhetoric
 - b.) Arguing the aesthetics of interaction, immersion, and experience

⁴ Indigenous convolution media are innovations resulting from the convergence of emerging digital media, old electronic analog media, and traditional indigenous media.

- c.) Presenting the rhetorical work produced via media content and medium
 - d.) Presenting indigenous convolution media for building public memory
2. Within the topic of a “Rival Hypothesis Stance” (Flower, Long, and Higgins)
 - a.) Presenting indigenous work stemming from what appears to be a rival hypothesis stance for joint inquiry among collaborators within an iterative design process for the development of indigenous convolution media.
 3. Community Literacy and Rhetorics of Public Engagement (Flower; Higgins, Long, and Flower)
 - a.) Presenting examples of community organizing and building local publics
 - b.) Presenting examples of rhetorical spaces that support dialogues
 - c.) Presenting rhetorical media that reveal hidden logics within society
 - d.) Presenting versions of what “going public” looks like when using rhetorical discourse via rhetorical media systems (in the case of this research, indigenous convolution media)
 - e.) Presenting rhetorical media that embody action that leads to further action
 4. Indigenous Rhetorics of Survivance and Place (Archibald, “Coyote’s Story”; Archibald, *Indigenous Storywork*; Lyons, “Rhetorical Sovereignty;” Lyons, *X-marks*; Powell; Basso 105-149; Feld and Basso)
 - a.) Presenting place-based rhetorical media systems whose ideation and construction represent indigenous self-determination
 - b.) Presenting place-based rhetorical media systems used for the exercise indigenous self-determination and sovereignty

Research Questions

The following are a series of research questions that I use to generate a theory of indigenous technological sovereignty. These are also generative questions that I consider when contributing to the worked examples exhibited in this dissertation.

1. How do indigenous peoples innovate indigenous convolution media from manufactured material culture, pervasive networked digital technologies, analogue electronic technologies, and traditional indigenous media? What do these innovations look like, and how do they work?
2. How is indigenous convolution media grounded by indigenous knowledge systems?
3. How do indigenous knowledge systems inform design methodologies and methods?
4. What is the rhetorical and functional work that emerges from indigenous acts of designing and constructing indigenous convolution media?
5. What are the rhetorical, aesthetic, and functional consequences of indigenous convolution media as artifacts?
6. What are the rhetorical, aesthetic, and functional consequences of indigenous convolution media as artifacts animated by users?
7. What are the rhetorical, metaphorical, aesthetic, and functional consequences of indigenous convolution media as user experience?
8. How is indigenous convolution media influenced by politics, culture and economics, access to materials, and by indigenous survival and resistance?

9. How do indigenous convolution media influence politics, culture and economics as indigenous survival and resistance?
10. How do indigenous convolution media operationalize indigenous sovereignty?
11. How do indigenous knowledge systems inform ethical applications and/or uses of technology?
12. In what ways do indigenous convolution media bridge notions of indigenous traditional and contemporary practices? How do these practices connect to indigenous ceremony, and how do they mediate indigenous re-imagined ceremony?

Relevance of Research To My Field of Study

The dissertation expands the rhetorical canon with an indigenous voice, which is largely absent from the academic rhetorical canon. This research also contributes a systems thinking approach to new theories and praxes of contemporary rhetoric within the following frameworks:

1. Rhetoric of Places/Spaces (Casey; Dewey; Foucault; Blair, Dickinson, and Ott)
 - a.) Understanding the material/ephemeral nature of digital media as rhetoric
 - b.) Understanding the material/ephemeral nature of indigenous convolution media as rhetoric
 - c.) Understanding the aesthetics of interaction, immersion, and experience
 - d.) Understanding the rhetorical work produced by mediums and media
 - e.) Understanding the rhetorical work produced by uses of mediums and media
 - f.) Examining new innovations for building public memory
2. Rival Hypothesis Stance (Flower, Long, and Higgins)
 - a.) Rivaling as a method for joint inquiry among collaborators within an iterative design process for the development of complex rhetorical transmedia systems (Flower, Long, and Higgins; Jenkins 334)
 - b.) Rivaling through productions of rhetorical media

3. Community Literacy and Rhetorics of Public Engagement (Flower; Higgins, Long, and Flower)
 - a.) Community organizing and building local publics
 - b.) Developing rhetorical spaces to support rivaling and community dialogues
 - c.) Developing rhetorical media to reveal hidden rhetorical logics within society
 - d.) Going public with rhetorical discourse via rhetorical media systems
 - e.) Developing rhetorical media that embody actions leading to further action

4. Indigenous Rhetorics of Survival, Resistance, and Place (Archibald “Coyote’s Story”; Archibald, *Indigenous Storywork*; Lyons, “Rhetorical Sovereignty;” Lyons, *X-marks*; Powell; Basso 105-149; Feld and Basso)
 - a.) Producing rhetorical media systems that in and of themselves are indigenous rhetorics of survival and resistance
 - b.) Producing rhetorical media systems that people can use to perform indigenous rhetorics of survival and resistance

CHAPTER 2

FRONT END FILTER

Uses of the Term “Indigenous”

Indigenous methodologies scholar Linda T. Smith states that using the term “indigenous” is problematic because it reifies diverse peoples as a singular population (6). According to Smith, other terms such as Native American also collectivize diverse populations, and that groups often have their own names that they use to refer to themselves as (6). She clarifies that names of self-identification often derive from a group’s respective language and worldview. Similarly, as in Smith’s work titled *Decolonizing Methodologies: Research and Indigenous Peoples*, these specific self-determined labels by groups will generally not be used in this research.

Despite the problematic nature of the word indigenous, this term will be the primary way I will refer to diverse peoples. My intentions for using the term indigenous are pragmatic in the sense that it is not possible for me account for, in this research, all of the indigenous names of self-identification in the world. To clarify my own definition of indigenous, the term, in this research, refers to diversity and not to a single group. This definition is intended to contribute toward a dialogue among diverse peoples. As this research refers to diversity and invites inclusion, it also emanates from my singular and limited indigenous perspective, a perspective that is rooted in the Southwestern United States, and heavily influenced by American Indian, Mexican American, and Southwestern United States intercultural borderlands discourses.

Indigenous research methods scholar Shawn Wilson refers to indigenous peoples as first peoples. Within this research, the term indigenous refers to both first peoples and to what Wilson describes as an adjective “relating to Indigenous people and peoples” (15). According to Wilson, the term indigenous has academic implications that are politically tied to the reclamation of the term by first peoples, referring to generations of those who continuously inhabit lands inherited from ancestors who were the first to reside on a given geography. The word indigenous is also used in this research to refer to those who have been geographically relocated by military colonial force, or who are forced to relocate as a result of economic and environmental disparities created by predatory and violent economic policies.

Uses of the term indigenous in this research align with frameworks of indigenous self-determination developed within academia, tribal governments, and multinational institutions (i.e. such as the United Nations). In cases of international assemblies of indigenous peoples, the term indigenous stems from shared narratives of colonization by diverse peoples throughout the world who are struggling, under subjugating political and economic forces, to operationalize their sovereignty and human rights (1-2).

Wilson uses Indigenous with a capital-I to signify the self-determination of indigenous peoples. This dissertation uses indigenous with the lowercase-i, extending Wilson’s definition to include the complex range of social-cultural-political-economic diversities amongst first peoples throughout the world. In this research, the term indigenous acknowledges that indigenous peoples throughout the world are distinct or diverse, that they do not all speak the same language, and that they may or may not hold

the same values, have an awareness of one another, recognize each other as indigenous, and may be friendly or adversarial toward one another.

The word indigenous in this dissertation also refers to the existences of indigenous knowledge systems embodied and enacted by indigenous peoples, which almost always stem from: indigenous people's community based relationships to ancient ancestral geographies; the survival of indigenous peoples within these places or local biomes; and a people's dynamic accumulation of place-based ancestral knowledge over long stretches of time. In other words, the term indigenous in this research describes peoples who are connected to the ecologies of their lands through emergent local knowledge systems and practices that have been passed down from generation to generation for thousands of years.

Despite the unfortunate limitations of a single word to express complexity, I will use the term indigenous as a tool to address diverse and often networked peoples whose cultures and lands have been systematically altered and constrained by colonization via governmental, religious, and economic forces (L.T. Smith 7). Smith quotes Wilmer who states, "indigenous peoples represent the unfinished business of decolonization" (7). My interpretation of Wilmer's use of the term decolonization is *establishing indigenous self-determination and sovereignty to resist and overcome the subjugating forces of colonization*. Through this interpretation, Wilmer's statement succinctly defines an application of the word indigenous for this research, as this research strives to convey theories of the medium and media designed to support the self-determination and sovereignty of indigenous peoples throughout the world.

Researching Indigenous Peoples

In this section, I use the label “indigenous scholar” interchangeably to refer to scholars who are of indigenous descent, to non-indigenous scholars who collaborate with indigenous peoples to conduct research, and to those who are scholars of indigenous descent that also collaborate with indigenous peoples to conduct research.

In 1969, the late Native American scholar Vine Deloria Jr. published *Custer Died for Your Sins: An Indian Manifesto*. Situated within Deloria’s book lies a critique of academia titled “Anthropologists and Other Friends” (78). In this chapter, Deloria flips the script by rhetorically repositioning researchers as the subjects of research. From his position as a Native American observer and scholar, Deloria uses a research methodology based on Native American humor to demonstrate the implications of traditional Western academic research in Native American communities.

Deloria observes the behaviors of researchers, and by ethnographically describing them through an indigenous lens he illustrates that researchers exhibit exotic and interesting colonial behaviors that inform primitive conclusions about Native Americans (78-100). The implications of Deloria’s analysis reveal caricatures or ridiculous stereotypes of researchers, which in turn illustrate what scholars are generally guilty of doing with regards to Native Americans. Deloria uses Indian humor to effectively critique classical anthropological research methods and methodologies. His humor illustrates how academia draws power by disciplining a colonial biased gaze of “subjectivity” upon indigenous peoples, which leads to romantic conclusions about Native Americans as primitive and noble.

Deloria revolutionized the field of Anthropology after effectively defending “Anthropologists and Other Friends” within academia (Biolsi and Zimmerman). Within this work, Deloria cites several instances where researchers use data to construct romantic anthropological theories, which he argues are “...irrelevant to the needs of the people” (93). Deloria refers to this academic process as a “conceptual prison” which American Indians have been thrown into, and warns all peoples who might attract the interests of researchers to beware of this risk (93).

According to Native American scholar Bryan Brayboy and his colleagues, the critique of research within indigenous communities dates all the way back to the work of Native American scholar Arthur C. Parker, who in 1916 published an article titled “The Social Elements of the Indian Problem.” According to Brayboy et al., Parker argued that research was implicated in colonization, and that colonization denied indigenous peoples agency to determine their own intellectual pathways (425-426). Brayboy et al. cite that Parker does not provide a framework for research methodologies and methods, but that he makes the important case that a people’s intellectual self-determination is rooted in the values that span their ways of knowing (epistemology), ways of being (ontology), and beliefs (axiology). These ideas would provide the foundation for the development of Critical Indigenous Research Methodologies—the primary methodological framework used in this research.

Despite the large amount of scholarship on indigenous peoples, indigenous scholars have observed that this research is often useless to indigenous communities because the ontological, epistemological, and axiological frameworks typically used in

traditional Western research do not acknowledge the relationships between the researcher and the researched. Neither do they account for the relationship of the researcher to data collected or the relationship of research subjects and the places they inhabit (Brayboy et al.; “Custer Died”; Lomawaima; L.T. Smith; Tuck; Wilson). These same scholars argue that classical academic research epistemologies lead to abstract conclusions that are largely out of context and systematically generated to support colonial theories and assumptions about indigenous peoples. Deloria argues that the issues indigenous peoples are facing will continue to be overlooked as long as scholars use their privilege to position indigenous peoples as objects of research (94-96).

Deloria reminds us that, despite researchers’ aggressive interests in American Indians, academia failed to support Indians in 1954 when the United States Senate promoted a policy for the termination of Indian rights (94-95). According to Deloria, not one single scholar showed up with data, arguing that some data may have been helpful during a time when Native Americans struggled to defend their rights. Despite the costs of research to indigenous peoples, a lack of reciprocity prevailed as scholars were incentivized with academic promotions and prestige (95).

In many cases, the construction of romantic theories continues to cast indigenous peoples in accordance with colonial stereotypes and assumptions. Indigenous scholars charge that research is historically carried out as a process of resource extraction, and is justified through the doctrine of academic freedom (Brayboy et al.; “Custer Died”; L.T. Smith). While there have been recent academic reforms introduced by indigenous

researchers, these scholars imply that many academic professionals continue to demonstrate a lack of reciprocity towards the indigenous communities they research.

Shortly after the publication of Deloria's critique, indigenous scholars began to shed more light upon the relationship between research and indigenous peoples (Brayboy et al.; Lomawaima; L.T. Smith; Tuck; Wilson). These indigenous scholars have pointed out that, since the dawn of colonization, researchers have constructed economies reliant upon knowledge harvested from indigenous communities. In addition to Deloria, these indigenous researchers also cite that, throughout the colonial history of these research-based economies, there have been little to no benefits for indigenous peoples subjected to the gaze of research, and that research, instead, is implicated in violence.

Brayboy et al. reference a host of scholars (Battiste & Henderson, 2002; Deloria Jr., 1969; Hart, 2010; L.T. Smith, 1999) in order to specifically identify the violence historically associated to research as the "...looting of cultural knowledge, artifacts, and even bodies and genetic material; anthropological re-castings of histories, cultural practices, representation, and understandings of self, community, and sovereignty through outsider-eyes; and a placing of study and knowledge outside the community such that community members become objects to be studied as this knowledge production fails to reflect Indigenous values" (428).

As the result of violence at the hands of research, Maori scholar Linda T. Smith claims that, for many indigenous peoples, the term "research" is vulgar. She argues that research is synonymous with colonization to the degree that indigenous peoples have written poetry on the issue. Smith testifies that she has often heard from indigenous

people: “We are the most researched people in the world” (3). Smith argues that this belief demonstrates the lack of confidence indigenous peoples have about being the subjects of research. This cynicism is often built upon differentials of power and privilege between researchers and those who are researched (3-4).

Indigenous scholars are currently responding to the critiques by Parker, Deloria, and Smith by reforming research practices. The goal of these reforms is to create academic capacities that serve the publics who are researched. Smith describes this new academic paradigm as one that is expected by researchers to provide emancipatory outcomes for minoritized peoples (4-6, 107-122).

Although there are efforts afoot to reform research practices, Smith also offers a critique of emancipatory research, identifying a methodological assumption that constructs differentials of power and privilege between researchers and those who are the subjects of research (1-18). This differential is significant because it threatens the intentions of emancipatory research to provide useful research outcomes to the communities that are researched.

Smith unpacks her critique by pointing to a specific value embedded in academic training. She cites that the philosophy of scientific research is based upon the idea that its outcomes are beneficial to all of humankind. She argues that the positivism embedded in academic research “...becomes so taken for granted that many researchers simply assume that they as individuals embody this ideal and are natural representatives of it when they work with other communities” (2).

This point by Smith ties to concerns voiced by indigenous peoples that researchers have been known to act paternally towards indigenous communities, often inserting themselves as authorities on what is best for communities. These acts of paternalism are systemic of colonization, and highlight what Native American history scholar K. Tsianina Lomawaima refers to as "...a struggle for power and tribal sovereignty..." for Native peoples (1). Lomawaima is not alone in her assessment, but is in the company of the aforementioned scholars that are making similar arguments.

According to Lomawaima, matters of indigenous sovereignty are bound up within the enacted relationships between scholars and indigenous peoples (1). Lomawaima highlights that the nature of these relationships has been shifting over the past four decades. Throughout this time, Native American communities have struggled to protect their rights by gaining control over issues such as: access to subjects; ownership over data; analysis and interpretation of data; and the distribution of research conclusions (1).

After recent decades of struggle, indigenous communities are now forming their own regulatory bodies that have the capacity to legislate and administer research protocols and permits (Lomawaima 8-15; L.T. Smith 118-122). These governing bodies exist to address both ethical and legal concerns in order to protect subjects of research, which also protects the institutions who are responsible for carrying out research. Lomawaima argues that these latest acts of self-determination by many indigenous communities should not be seen as impeding research, but instead should be viewed as an opportunity to ensure quality research (13-15). Lomawaima reminds scholars that indigenous self-determination with respect to research is a way for indigenous

communities to ensure high-quality research that is of value to indigenous peoples, and very much needed in indigenous communities (13).

Part of the struggle for indigenous self-determination within the context of academic research includes assessing the value of research to indigenous peoples in relationship to its costs. In a recent article published in the *Harvard Educational Review*, indigenous scholar Eve Tuck calls attention to what she refers to as “damage-centered” research. Tuck describes this as “...research that intends to document peoples’ pain and brokenness to hold those in power accountable for their oppression” (409). Tuck demonstrates how this strategy has had moments of success in forcing legal reparations for peoples of minoritized communities, but she also urges us to question the costs.

According to Tuck, these costs are public perceptions that minoritize peoples as “...depleted, ruined, and hopeless” (409). Tuck reminds researchers to be wary of using deficiency models of others for research, and calls for a moratorium on such practices while also inviting researchers to re-imagine ways to document subjugation, as well as to consider the long-term effects on communities when they are influenced to think of themselves as broken (412-424).

Common topics associated to damage-narratives include topics such as addiction, poverty, violence, abuse, illness, etc. (413, 415). According to Tuck, the problem with these narratives, as in the case of Native Americans, is that they ignore context (415). Her concern is that by rendering context invisible, peoples who are the subjects, and sometimes producers, of damage-centered narratives might often come to believe these narratives as natural extensions of themselves (412-415). Tuck argues that, by advancing

damage-centered narratives, researchers are ignoring historical and ongoing sources of oppression such as colonization in the case of Native Americans.

One of the solutions to these issues is a recommendation that moves research from concepts of deficit to those of desire. A desire-based approach to research, referred to by Tuck as “Researching for Desire,” becomes useful because it emerges from the self-determination identified from a community that is itself the subject of research (416). In other words, directions for research are based upon the needs and desires expressed by communities. This approach differs from labeling peoples with pathologies that inscribe power and describe people as if they are only “damaged.” Tuck argues that researching for desire can help complicate oversimplified and subjugating narratives in ways that allow people to take control and demonstrate their hope and resiliency (416-419).

Tuck encourages a moratorium on damage-centered research, and provides a few recommendations moving forward. The first set of recommendations encourages the development of new frameworks and community capacities that can determine if and to what degree research can advance particular community needs and desires. The second recommendation is to develop community governed and enforced ethics guidelines for research, providing pathways of self-determination capable of protecting communities from the violence via research cited earlier in this review. The third recommendation is to think of ways that communities and researchers can work together to achieve mutually beneficial outcomes with benefit requirements to communities and the power of communities to decide if the benefits or research proposals are worthwhile (422-424). These recommendations by Tuck have the potential to yield research that is co-

constructed with the subjects of research, while also providing researchers with opportunities to collaborate with communities to contribute useful outcomes to the communities themselves.

Advancing the work of critique while also responding to Tuck's recommendations, Brayboy et al. propose what they refer to as a Critical Indigenous Research Methodology. This research philosophy dialogues with what indigenous researcher Shawn Wilson refers to as Indigenous Research Methods, which is an idea he publishes in his book *Research is Ceremony: Indigenous Research Methods*. Both Brayboy et al. and Shawn Wilson provide academic frameworks for researchers about how to co-conduct research with indigenous peoples.

The core principles of these methodologies are based upon indigenous epistemological concepts such as what Brayboy et al. refer to as "relationships, responsibility, respect, reciprocity, and accountability" (423). These 4 Rs are described by Wilson as sacred (axiological) or ceremonial in nature and, according to Brayboy et al., they represent a productive research agreement between researchers and indigenous peoples (Brayboy et al. 436-440; Wilson 77-79). Through the 4 Rs, both Brayboy et al. and Wilson provide pathways for research objectives that serve community agendas tied to issues related to social justice causes. These frameworks provide philosophies and guidelines that can be put into practice to address the recommendations by Tuck.

Critical Indigenous Research Methodologies, American Indian Studies Methodologies, and Indigenous Research Methods provide the guiding research methodologies for this dissertation. Many of the methodologies, methods, and critiques

by Brayboy et al., Tuck, and Wilson derive from foundational indigenous research practices that indigenous communities have aspired toward for centuries.

Despite dominant academic research methodologies, the research in this dissertation represents an effort and struggle, through acts of theory-making and praxis, to advance culturally-responsive methodologies when researching indigenous peoples. The challenges and intentions of this research are to use research methodologies that are designed to avoid replicating research practices implicated in the colonization of indigenous peoples.

Research Methodologies

The methodologies that guide this research are informed by academic critiques of classical academic research practices. These critiques implicate academic research in the historical and ongoing colonization of indigenous peoples. Opposed to colonization, this dissertation reflects efforts to advance new research practices designed to respond to the emancipatory goals of indigenous peoples by transforming how research is enacted, as well as for what purposes it is enacted (Brayboy et al. 423-424; Lomawaima 2; Smith 115-118, 123-141; Tuck 424; Wilson 15-17, 20).

To engage in the transformation of academic research, this dissertation mainly draws from the work of indigenous scholars Bryan Brayboy et al. who propose what they refer to as Critical Indigenous Research Methodologies; from Eve Tuck who proposes desire-based research; and from indigenous scholar Shawn Wilson who has written about a concept he refers to as an indigenous research paradigm. This dissertation exemplifies an effort to bring these and other related research methodologies into practice.

For the sake of simplicity, the methodologies that guide this research will be referred to as “connected-knowledge research methodologies,” which draws from multiple research methodologies. These methodologies guide the implementation of indigenous and academic research methods with the intention to produce outcomes that are potentially useful to indigenous peoples. In this section, I present the research methodologies that define connected-knowledge research methodologies.

The methodologies used in this research are derived within the academy and from the practices, research, and rhetoric of: indigenous and non-indigenous scholars who

work in Native communities; indigenous peoples outside of the academy who were involved in creating outcomes that are presented in this dissertation; and the methodologies for inquiry imparted upon me by members of my community (which are largely based upon the ethics by which I was raised). The connected-knowledge research methodologies used in this dissertation facilitate and respond to co-intentionally inclusive research processes with indigenous and non-indigenous collaborators doing research at a local indigenous community, as well as within art and technology collectives whose productions are exhibited in this dissertation.

Connected-knowledge research methodologies originate from indigenous spaces, places, and peoples, as well as the academy. Because of this, the methodologies employed in this research include the appropriation of western philosophies and their positioning in relation to indigenous research philosophies. The purpose of drawing this connection is to contribute research intended to be useful for the self-determination and sovereignty of diverse indigenous peoples, and to produce rigorous academic scholarship. Coming from the field of Rhetoric, this dissertation spans academic disciplines including Diversity Studies, Justice Studies, the Learning Sciences, Art, and Technology.

Although there are epistemological distinctions between western and indigenous research methodologies, this research argues that these differences do not necessarily render indigenous and western research methodologies mutually exclusive from one another. Like in Wilson's arguments, the purpose of this cross-cultural approach is not to make value comparisons between systems, but to look for similarities while being careful not to conflate differences, especially since differences can be generative and productive

(Flower 56-57, 162-163; Flower, Long, and Higgins 27-47). This research is meant to be a site of comfort between differences, and an intersection, comprised of diverse research philosophies, that values differences as tools for generative problem solving.

While remaining vigilant of the distinctions between indigenous and Western worldviews, connected-knowledge methodologies are based on the assumption that, by identifying areas of overlap between indigenous and Western research philosophies, it is possible to develop and practice research methods built upon values that genuinely reflect the cross-cultural nature of this dissertation. Connected-knowledge research methodologies inform us that identifying similarities while also using differences, towards inquiries, that are beneficial for indigenous communities is an acknowledgement of cross-cultural respect for the indigenous and non-indigenous spaces from which this research emerges (Brayboy et al.; Flower, Long, and Higgins 27-47; Lomawaima 14-15).

While acknowledging the relationships between diverse research methodologies, connected-knowledge methodologies embody cross-cultural dialogues with the goal of producing rigorous academic scholarship that is useful for indigenous peoples. Creating mutually beneficial outcomes of research that are useful to both indigenous communities and the academy is one of the key principles of desire-based research (Lomawaima 2, 13-15; Tuck 424). To be clear, the research methodologies that guide this dissertation are created for academic scholarship, and are developed and employed with the intention to contribute knowledge and (or) produce outcomes that are useful to indigenous peoples.

Throughout this dissertation, variations in language and voice will be intentionally positioned as a way to connect and reflect varying epistemologies and

ontologies (Flower 232). This intentionality will be reflected in sections with language tones that range between formal and informal. There are sections of this research that use language containing jargon, while at other times avoiding jargon. In addition to this, there are sections written in the objective third person, and other sections written in the informal first person point of view. Discretions to use these multiple modes of language are largely based on the effectiveness of these language paradigms to communicate particular perspectives and ideas that reach out to diverse academic and non-academic audiences. The ways by which language is designed in this research are not meant to alienate any of the readers of this dissertation, but are instead positioned to best articulate ideas, to speak within various political contexts and rhetorical situations, and to honor multiple knowledge traditions.

The following paragraphs will define connected-knowledge methodologies by unpacking the key principles of: desire-based research; Critical Indigenous Research Methodologies; an indigenous research paradigm; intercultural rhetorical inquiry; and Resolana, a dialogical framework for learning that embodies methodologies for research imparted upon me by mestizo elders and members of my community (Brayboy et al.; Montiel, Atencio, and Mares; Tuck; Wilson). All of the following principles define the connected-knowledge methodologies that guide decisions about which research methods were chosen and how they were used in order to conduct research for this dissertation.

Connected-knowledge research methodologies are fundamentally grounded by a proposal referred to by indigenous scholar Eve Tuck as desire-based research or “Research for Desire.” Within the context of “Research for Desire,” this dissertation is

opposed to, and does not engage in, practices of what Tuck refers to as “Damage-Centered Research,” which constructs models of deficiency as a strategy to demonstrate injustices (409). According to Tuck, these deficiency models use damage narratives that describe peoples as damaged victims who are cast as “...damaged, depleted, and hopeless” (409). Tuck argues that these damage-centered strategies, no matter how effective within certain contexts of justice, come at a cost of negative self-perception, which erases the dignity of peoples by failing to acknowledge the resourcefulness, complexity, and resiliency of peoples within contexts of adversity (409-424).

Instead of Damage-Centered Research, this dissertation strives to listen, provide spaces for reflection, invite critique, frame problems through multiple contexts, and generate complexity. It does not provide a contribution to discourses based upon damage, but instead highlights the complexity of peoples while also considering multiple contexts that influence the lived realities of people. In order to highlight complexity, this research makes rigorous efforts to listen and respond to the expressed needs and intentions of groups of indigenous peoples, as well as the voices of diverse indigenous peoples throughout the world (that is, to the degree by which this is possible, given the limitations of a dissertation and my limited abilities as an individual to respond to the vast diversity of peoples).

This dissertation highlights contemporary issues, generates theories, and recommends potential solutions. This research can be understood as a signal fire or beacon of communication. Like many signal fires, at times this research may appear didactic. However, despite the rhetorical and sometimes seemingly polemical

intentionality of this dissertation, it does not assume to be truth, but instead is meant to be a set of ideas contributing to a dialogue. This research is not a commanding beacon, nor does it simply send signals. Instead, it is a debatable perspective whose nature also depends on listening to a network of other signals. Aside from the rigorous academic challenges that it must endure, it is a thoughtfully crafted theoretical contribution to which power is largely inscribed by indigenous peoples themselves. In other words, this dissertation considers its role in helping address contemporary indigenous challenges by inviting indigenous peoples to determine the extents of its usefulness and limitations.

Tuck proposes that we “Re-vision our theories of change” and think about the role of research in its ability to address particular topics (423). She also suggests that the usefulness of research is based upon who is involved in the research and what research methods are used. To sum it up, Tuck challenges researchers to evaluate how actions lead towards desirable outcomes. In the case of this dissertation, considering the position of the researcher provides a key to re-visioning a theory of change. This research highlights examples of praxis where the researcher generates complexity by simultaneously assuming the roles of both insider and outsider. Such a methodology has the potential to yield insights that may not emerge through any other philosophy; at the same time, it produces limitations associated to subjectivity. Perhaps, to varying degrees, this is true of any singular researcher studying any phenomena.

Despite the undeniable successes of the Western scientific method to predict the naturally occurring phenomena that define the natural sciences, scholars argue that this method has not been accurate or ethical when applied to the study of indigenous peoples

(Brayboy et al.; “Custer Died”; Lomawaima; L.T. Smith; Tuck; Wilson). Instead, these critical scholars argue that the Western scientific method has been effectively used to inscribe colonial power, which is an outcome largely influenced by the values embodied by researchers. In the case of history, indigenous methodologies scholar Linda T. Smith reminds today’s researchers that indigenous knowledge remains one of the many extracted commodities of colonization, and that “Indigenous peoples were classified alongside flora and fauna...” and then placed into biased systems of representation and categorization designed to support colonial assumptions that indigenous people were less than human (59-60, 78-94). Critical scholars also remind researchers that colonization continues to occur within many of today’s research practices.

Although the Western scientific method requires the objective observation and analysis of phenomena, new research demonstrates that cognition does not occur without emotion (LeDoux303; Damasio *xi-xix*). These findings demonstrate that, despite scientific beliefs of objectivity that continue to pervade academic research methods, there is evidence of the deep implications associated to the relationship between the researcher and the object of study. It is beyond question that the Western scientific method has been successful at producing many exciting outcomes in the applied sciences. However, within certain fields in the humanities, Western science has often not been as successful at producing research that is useful for indigenous peoples. Neither has it been successful at drawing sophisticated conclusions about indigenous peoples (“Custer Died” 93).

Within the context of the Cartesian scientific worldview, this research is the outcome of the researcher’s binary position as an insider (associated in relationship with

the subject of the research gaze) and outsider (the gazing researcher himself). Within many indigenous worldviews, these differing vantages are often not focused as a binary, but as a relationship instead. This particular relationship has the potential to yield complexities that highlight something about both the researcher and subject. It produces what Shawn Wilson describes as a vital aspect of an indigenous research paradigm: a constructivist approach where the researcher must cultivate complex relationships and take accountability for his/her research, while also constructing mutual realities that result from relationships between researchers and subjects (36-37, 77).

The constructivist methodology cited by Wilson helps define the methodology of this research. Furthermore, in many instances this methodology is also extended to account for both the insider and outsider positions of the researcher. This is built on Wilson's argument that reality is fluid, and largely emergent through dependencies such as people and the places they inhabit (37, 86-91). The following is a short list of vantages that reflect the researcher's positionality, which are simultaneously contextualized by both the academy and worlds outside the academy. These vantages are purposefully asserted in order to thoughtfully produce this dissertation:

- Indigenous Mestizo who is an Academic Scholar (both insider and outsider)
- Indigenous Mestizo who is a Design Practitioner (both insider and outsider)
- Observer and contributor to the subjects of research (both insider and outsider)
- Subjective and Objective Theorist, Ethnographer, and Data Analyst (both insider and outsider)

- Artist-scholar whose rhetoric employs indigenous convolution media (both insider and outsider)
- Indigenous Mestizo from the Southwest Borderlands who is also a scholar working within an academic institution in residence within the Southwestern United States (both insider and outsider)
- Indigenous bilingual researcher in Arizona, communicating in multiple languages that include English and indigenous influenced dialects of Spanish during the processes of research (both insider and outsider)

This list represents a set of complex internal relationships within the researcher. Furthermore, the complexities of these relationships are extended by additional relationships the researcher constructs with his mentors, collaborators, and members of communities (Brayboy et al. 436-437). This complex network of relationships ultimately shape a sense of reality projected by this dissertation. This dissertation is not truth, but a unified theory predicated on a sense of reality that is the result of complex relationships. This sense of reality acknowledges that there is a diversity of worldviews that both productively compliment and rival this research.

In addition to “re-visioning our theories of change,” Tuck also encourages researchers to consider indigenous-led ethics guidelines and conditions of research in order to protect indigenous knowledges and artifacts from being misappropriated or disrespectfully managed (423). A part of this dissertation includes research in an Arizona Native American community, where authorization to proceed with research was made possible through a pilot of the community’s own internal ethics review board, including a

tribal-led memorandum of understanding and non-disclosure agreement between the Arizona Native American community and the academic/research institutions involved.

The tribal internal ethics review pilot and its connection to university internal review board approvals demonstrate an important exercise of self-determination and sovereignty by the community within which some of the research for this dissertation took place. This assertion of sovereignty provided a valuable framework from which participating collaborators and researchers were able ground the development of relationships and mutual respect towards one another. These relationships produced a dialogical place and process that accounted for both insider and outsider perspectives, which together informed the design of research. These relationships provided researchers and community members with opportunities to strategically coordinate their combined resources in order to respond to the needs and desires articulated by the community.

In addition to Tuck's recommendations and the ways they have been interpreted for this research, the work of scholars Bryan Brayboy et al. also provide a component of connected-research methodologies, which are identified by Brayboy et al. as the key principles of Critical Indigenous Research Methodologies. These key principles both overlap and extend Tuck's vision for desire-based research. All of these principles are integrated into the connected-knowledge research methodologies framework and are applied to the development of this dissertation. The key principles identified by Brayboy et al. are as follows:

1. Critical Indigenous Research Methodologies (CIRM) is rooted in Indigenous knowledge systems, is anti-colonial, and is distinctly focused on the needs of communities.

2. CIRM is rooted in relationships, responsibility, respect, reciprocity, and accountability.
3. Research must be a process of fostering relationships between researchers, communities, and the topic of inquiry.
4. CIRM recognizes the role of particular components that make it viable for communities, but ultimately, it is of little use to create frameworks rooted in these principles if these methodologies do not also promote emancipatory agendas that recognize the self-determination and inherent sovereignty of indigenous peoples (423-424).

In addition to Critical Indigenous Research Methodologies, the methodological approach to this research is also informed by the work of Cree scholar, Shawn Wilson, who proposes what he refers to as “Critical Research Paradigms.” Both Brayboy et al. and Wilson propose that an indigenous research paradigm is guided by indigenous knowledge systems and indigenous values. These systems and values are based upon a given people’s ontology (way of being, beliefs) and epistemology (way of knowing and doing, thinking and learning), and are tied to indigenous peoples’ relationship with their given land or biome (Brayboy, “Indigenous Knowledge;” Wilson 86-88). Brayboy et al. and Wilson argue that indigenous ontologies and epistemologies diversify the lenses of research, and help to align research in accordance with indigenous values.

Indigenous knowledge systems and their associated ontologies and epistemologies circulate throughout this research as a result of the indigenous mestizo background of the researcher, the indigenous peoples who participated in the research, the artifacts presented in this research, the Southwestern United States (borderlands) region in which this dissertation was written, and in relation to those who produced the artifacts that are exhibited in this dissertation.

The key principles, presented in points 1 and 4, of Critical Indigenous Research Methodologies overlap with the proposals articulated by Tuck in desire-based research, and have been explicated in previous paragraphs. Points 3 and 4 focus on the importance of Relationships, Reciprocity, Respect, and Responsibility, which also tie to the idea by Brayboy et al. that these “4Rs” must lead to relationship building between “...researchers, communities, and the topic of inquiry” (423, 437). These principles clarify a way of being and doing that guides this research.

Through Critical Research Methodologies, the 4Rs are interpreted in this research as “Relationships” being the central “R,” while Reciprocity, Respect, and Responsibility define the nature of “good” Relationships. Reciprocity represents sharing and co-intentionality within a relationship. Reciprocity is a relationship built upon mutual respect and responsibility/accountability – in other words, a relationship that strives to achieve a sense of equity. This dissertation is a direct result of the 4Rs by which the author of this dissertation has strived to enter into relationships built upon reciprocity, respect, and responsibility with his mentors, collaborators, members of communities, lands and places by which he hails from, lands and places by which he is a guest, and the knowledge that is presented in this research. In the case of all these relationships, the goal of this research is to model the construction and dissemination of knowledge based upon learning through processes of caring for people, places, and knowledge.

Practices of the 4Rs are interpreted by the researcher in accordance with the teachings of knowledge keepers and teachers from the community in which he was raised. In this research, the art of dialogue via indigenous Northern New Mexican

philosophies for speaking and listening are also applied to this research. These dialogues are known throughout Northern New Mexico as Resolanas, which are described by community elders as a philosophy and actions that support both a place a process for dialogues (Montiel, Atencio, and Mares xi-xiv, 5-6). These Northern New Mexican practices generate a sense of place, collaborative storytelling, and deep reflective listening. The applications of indigenous methodologies that are part of the researcher's cultural upbringing also tie this research to land and place, providing the researcher with an indigenous power source from which to enter dialogues guided by the 4Rs.

A key philosophy of Resolana, also tying to Indigenous Research Paradigms, is the idea that, in order for the intended outcomes of these methodologies to manifest themselves, which is to create research useful to academia and the needs and desires of indigenous communities, there must be a practice of reciprocity involved, a place where trust and mutual understandings can emerge over time. In the sense of a community dialogue for collaborative storytelling such as Resolana, community gatherers work co-intentionally together to create learning communities that are tied to place.

In terms of applying the idea of co-intentionality, Iain J. Davidson Hunt and R. Michael O'Flaherty demonstrate an approach to co-intentionality that runs parallel with the Resolaneras/os. Hunt and O'Flaherty refer to co-intentionality as the key principle of their methodology toward the establishment of an approach to research they refer to as place-based learning communities. Like the Resolaneras/os, these researchers operationalize co-intentionality through practices of dialogues that are networked and designed to operate as think tanks for learning, understanding, and responding to local

issues and problems that need to be solved (291-304). In both cases, the emergence of Resolanas and place-based learning communities are dependent upon relationships and trust building. Both of these frameworks require iterative practices of communication where respective worldviews can be iteratively shared and mutually understood through respect, and over a period of time.

Hunt and O’Flaherty succinctly explain that the “...goals of a place-based learning community are to *support people in responding to their own needs, developing a capacity to generate their own research projects, creating supportive relationships with other actors through the building of dynamic processes for the coproduction of locally relevant knowledge*” (295). This is not unlike the other aforementioned indigenous research frameworks that define the connected-knowledge research methodologies employed in this research.

Place-based learning communities are a framework for cross-cultural partnerships, and have been successfully applied to resource management projects between institutions and First Nations Peoples. These communities, along with the other research methodologies highlighted in this section, connect to form connected-knowledge research methodologies. These methodologies reflect both academic and indigenous community places of origin, and are used in this dissertation to address the limitations of established academic research that concern or claim to represent indigenous peoples.

The purpose of place-based learning communities and connected-knowledge research methodologies is to equalize power differentials through what Hunt and O’Flaherty refer to as intimacy, which they describe, by quoting Hugh Raffles, as “a site

for the social production of knowledge and the reworking of human-nature boundaries. (qtd. in Hunt and O’Flaherty 294)” Hunt and O’Flaherty describe intimacy in research as a process that is always: about relationships; tied to place; embodied; and existing “within a field of power” (294). The goals of enacting connected-knowledge methodologies in this research is to generate research practices that support the production of research useful to indigenous peoples, and to create research frameworks where indigenous peoples themselves are also research stakeholders.

Research Methods, Timeline, And Process

This dissertation is composed as a series of short and long form essays contained within Chapters 3-6. Each essay of this research is self-contained and therefore written to function as a standalone article. At the same time, the essays are also designed to connect with each other into a seamless conceptual research narrative that clearly explicates the thesis of this dissertation.

Guided by the research methodologies outlined in the previous section, this qualitative research was based on data collection methods that include archive research, ethnographic observations, interviews, and personal testimonies. Combinations of all these data collection methods were employed to collect data for this research.

The archive research for this dissertation was conducted using the Arizona State University library system; published books, news media, and academic texts; published media by art museums, galleries, and festivals; and independently published work by art and technology collectives. All of the claims in this research are rigorously supported by citations and evidence, and are documented according to MLA standards. These citations and evidence underpin the original scholarship presented in this dissertation.

In addition to archive research, ethnographic observations and interviews were conducted at an Arizona Native American community charter school and a community college situated on the community's lands. All of the observations and interviews for this research took place at Arizona State University, at informal summer community college workshops for Native American middle school students, and in middle school classrooms. Research observations included documenting classroom activities and the

products of these activities. All the observations for this research were recorded using audio, photo, and video documentation equipment, as well as observer field notes. The interviews of students, teachers, and community members were recorded using audio and/or video documentation equipment. This audio/visual media was later transcribed into textual data for the purposes of analysis. All of the interviews for this research were conducted face-to-face with students, teachers, and various community members.

Throughout this dissertation, I position myself as an indigenous mestizo, occupying the perspectives of a scholar and an indigenous person. This multi-positional perspective is additionally extended in cases where I myself am a contributor to productions that are exhibited in this research. To provide further clarification, my observations and testimonies are situated in relation to the place where I am from, my ethnic and cultural background, as well as my artist and academic role as an observer/producer (maker) of rhetoric, theory, art and engineering — all of which are represented throughout the chapters of this dissertation.

The previous paragraphs provide an overview of the methods used to collect data for this research. In the following paragraphs, I will provide an overview of the methods used to analyze data in this research. These methods include discourse analysis, a generative art-based research analysis, a rival hypothesis stance, indigenous story-work, and an exhibition of worked examples (Archibald, *Indigenous Storywork*; Flower, Long and Higgins; Gee, *New Digital Media*; McNiff). All of these methods of analysis are applied to this research to generate theories of indigenous media and sovereignty.

Linguistic and critical discourse analysis methods are used in this research to generate both descriptive and critical analyses of the discourses embedded within researched texts, art and technology artifacts, and interview data. The purpose for using this method, at a descriptive level, is to understand how language works within the contexts of art, media/technology, learning, colonization, and indigenous sovereignty. In addition to gaining insights into language use and how it manifests into the creation of meaning, this research also uses understandings of how language works within the contexts mentioned above in order to promote and contribute towards dialogues that are social, cultural, political, and economic. In other words, in this dissertation I use my literacies skills to contribute essays towards dialogues that have the potential to contribute transformations of our emergent world by affecting policy and culture.

In addition to discourse analysis, an arts-based research method is used as a generative and iterative process for the co-development of media theories and supporting practices exhibited in this dissertation. In this dissertation, arts-based research is a method of inquiry by which I translate my creative process, ways of thinking, theories, values, assumptions and productions into an interdependent system of written language, artistic production, and technology innovation.

Because this research comes from an indigenous position, not one representing all indigenous peoples but broadcasted outward from one singular perspective, it is reasonable to identify this research as inherently political. To mitigate essentialist thinking and the construction of over simplified cultural models that sometimes result

from critical discourse, I am applying a rival hypothesis stance as a rhetorical inquiry method for building complexity (Flower, Long, and Higgins).

The written language produced for this dissertation is guided by a rival hypothesis stance. An aspect of this method works by leveraging and embracing multiple and sometimes rivaling points of view as a method for inquiry (Flower 56-57, 162-163; Flower, Long and Higgins 27-47). Through this stance, this dissertation also invites critique, and positions itself as a perspective within a much larger conversation regarding the relationship of media/technology and indigenous sovereignty — not as a competitive or defensive conversation, but one that embraces gifts of difference or rival perspectives for the purposes of developing complex systems of thinking.

As a rival hypothesis stance is used to generate complexity, the language of this dissertation is also guided by indigenous story-work (Archibald, *Indigenous Storywork*). Using an indigenous story-work methodology is not meant to suggest that this dissertation is in any way aesthetically recognizable as a seemingly indigenous traditional-like story, but that it is written using similar structural arrangements of language, ethics, and intentionality. In other words, as this dissertation strives to comply with academic frameworks, it is also written in the spirit of indigenous stories.

Lastly, this dissertation includes an exhibition of worked-examples that serve as a model for a particular way of thinking about and producing outcomes that support the thesis of this research. To honor the works exhibited in this dissertation, it is important to note that the artifacts themselves were not created with the intention to support this research. For the sake of clarity and respect, it is additionally important to note that it is

the curatorial premise of the exhibition of worked examples that connects the rhetorical nature of the artifacts to the thesis of this research. Just as discourse analysis is used to decode and comprehend language, an exhibition of worked examples is used to encode and make accessible particular ways of thinking, theories, values, assumptions and productions that guide the rhetoric of this dissertation (Gee, *New Digital Media* 39).

Now that I have provided an overview of the data analysis methods used in this dissertation, I will explicate all the aforementioned data collection and analysis of this research in greater detail in order to provide an in depth picture of how this dissertation was constructed and assembled.

Research in the Archives

This dissertation is supported by what I refer to as research in the archives, which is the researching and studying of published literature and media. Research in the archives is used in this dissertation to generate literature reviews as well as to provide reliable sources that support the original research provided in this dissertation. The sources that are used in this research were gathered from the Arizona State University library system, institutionally supported websites, published books, published news media, published academic texts such as articles from scholarly journals, and published media by art museums, galleries, and festivals. All of the sources used in this research are published by academic and peer-reviewed publications, reputable publishers of academic work, and reliable non-academic sources such as news media and websites supported by reputable institutions. The topics researched for this dissertation include:

- Rhetoric and Social Linguistics
- New Literacy Studies and New Literacies Studies
- New and Fast Capitalism
- Financial Capitalism
- Casino and Speculative Capitalism
- Violence and Predatory Capitalism
- Indigenous Sovereignty and Self-Determination
- Indigenous Knowledge Systems and Education
- Conceptual Indigenous Intermedia Art
- Art, Media, and Technology Theory
- Tactical Media and Hacking
- History of Technology
- Values and Technology
- Digital Media and Learning
- Participatory Design

Ethnographic Observations and Interviews

During the 2013-2014 school year, I along with three other researchers (Yasmin Kafai, Bryan Brayboy, and Kristin Searle) conducted a three-week digital media and learning workshop using an electronic textiles construction kit in four separate sections of a Native Studies course for middle school students at a local Arizona Native American community. Students used a construction kit during the workshops to build and program wearable circuits into fabric. In total, we worked with 76 seventh and eighth grade

students (47 females, 29 males) over four quarters. As part of a school-wide decision to gender segregate elective classes, Native Studies was segregated by grade and gender. Working with the Native Studies teacher and his aide, we designed each quarter around a culturally relevant theme connected to additional course material.

Themes included elements, plants, animals, and traditional foods. Each student chose a design related to their class theme and then created a electronic textiles artifact using LEDs, an Arduino microcontroller, conductive thread, conductive fabric, and felt. To complete their designs, students had to write computer algorithms and upload their computer code to the microcontroller in order to program the lights to blink according to how they wanted the lights to behave. These projects provided an embodied experience tied to a community value that included the importance of respectful relationships between people and to values taught in Native Studies, which were grounded in relationships between people and the natural world. As part of these efforts, we sought to provoke students to consider their relationships to electronic technology and how these relationships may be informed by indigenous knowledge systems, which include local community knowledge and technology practices.

For the purposes of this research, I will be presenting and analyzing data that my fellow researchers and I collected through face-to-face interviews with one of our community partners — the middle school Native Studies teacher who I refer to in this research as Mr. Ruben. There are a total of four interviews that took place throughout the 2013-2014 school year using an interview protocol designed to document Mr. Ruben's changing perceptions and attitudes about electronic technology throughout the school

year. I documented these interviews using an audio recorder, and my research partners and I had the audio transcribed into text for analysis. In the final chapter of this research, I present my analysis of these interviews as a case study in order to discuss some potential structural issues relating to history, culture, and society that are associated with digital and other media literacies capacity building in indigenous communities. The interview protocol used in this research is located in Appendix A.

Arts-Based Research

The primary research method in this dissertation is a generative multi-directional system of inquiry where knowledge both circulates and evolves. To explain this idea, I have written this dissertation at the intersections of theory making and practices of applied science and art. At this interdisciplinary site, I engage in a process where guiding theories of this research provides the frameworks by which I ground my artistic and technological practices, while, at the same time, I use the outcomes of these practices to, in turn, revise these guiding theories, and vice versa. This dialogical system may appear tautological through the lens of conventional research; however, this method of theory-making aligns with the traditional research practices of where I am from, where knowledge is cumulatively generated through hands-on iterative design and learning-while-doing processes. Furthermore, this learning-while-doing method guides and influences evolving theories, hypotheses, and practices that are also consistent with the design spiral in art, design, architecture, and engineering, and are consistent with my academic training in Art, Media and Engineering (Dewey 58-81).

Discourse Analysis

In this research, I apply discourse analysis methods to systematically analyze varying forms of rhetoric ranging from the activities of the U.S. space program to a case study of interviews with a middle school teacher regarding his perspective on digital media and learning. In this dissertation, I apply discourse analysis in order to understand the ways that discourses from multiple perspectives function within the framework of this research. I apply the results of my discourse analyses of textual and multi-modal data to support, rival, complicate, and extend the assumptions, hypotheses, theories, and claims that I argue throughout this dissertation.

Worked Examples

In Chapter 5 of this dissertation, I propose a series of what Digital Media and Learning Scholar James Paul Gee refers to as “worked examples.” The purpose of these examples is to encourage diverse groups to dialogue, debate, and define what constitutes “good work” within practices of indigenous convolution media (*New Digital Media* 44-45). These groups include artists, engineers, designers, scholars, curators, and especially members of indigenous communities coming from multiple disciplines. This research is concerned with the constitution of “good work” in relation to indigenous technological sovereignty, and the culturally-responsive digital media and learning specific to a given indigenous group, as well as across varying indigenous populations.

In an effort to encourage a discussion concerning practices of indigenous convolution media, I have curated some examples of art, technology, and research, on which I have collaborated with my colleagues in art and academia. I present this body of work in Chapter 5 of this dissertation as an exhibition of “exemplars.” These worked examples are unified by a series of relationships that potentially model “good work” for the further structuring of indigenous culturally responsive learning and the operationalization of indigenous technological sovereignty.

The general criteria I use to define what I mean by “good work” via worked examples is to identify indigenous led exemplars of indigenous convolution media that strive to offer alternative visions of public life that are productive (bent toward generative discovery), co-intentional (respectful of all participants), epistemic (grounded in joint inquiry), and intercultural (valuing difference as a resource for shared problem-solving).

Gee describes “good work” as examples that people in emerging areas of interest might come to mutually appreciate (*New Digital Media* 44). It remains to be seen if indigenous convolution media, indigenous technological sovereignty, and culturally responsive digital media and learning are areas of emerging interest. At this point in time, I would argue that these areas are frameworks for possibility as I theorize their relationship to indigenous sovereignty. In other words, as mentioned earlier, these are ideas whose implications are inconclusive; they are speculative, and built upon many assumptions because they are in their earliest phases of development. Because of the lack of deeper understanding regarding the impact of indigenous convolution media, my hope is that the exhibition of worked examples in this research will help to catalyze a dialogue, generate greater interest, and inspire knowledge creation and new practices (44-52).

For the sake of clarity, the worked examples featured in this research are related to the places by which they are established, and therefore only speak from the perspective of the indigenous worldviews tied to their places of origin. These limited perspectives are the reason why it is important for a dialogue to occur, not only around what I present in this research, but through other worked examples representing a larger diversity of indigenous peoples in the world.

Many scholars and workers from multiple disciplines and sectors are contributing to a dialogue via working examples within digital media and learning. This community is calling for individuals and groups to share their working examples, which can be their own work and ideas or just about anything that might contribute to conversations and

collaborations that potentially help to galvanize areas of emerging interest in Digital Media and Learning (“Worked Examples” 44-52).

In the case of this research I am offering both a unified theory of media and indigenous sovereignty and an exhibition of working examples that support this theory. The exhibition is comprised of indigenous convolution media and research by indigenous-led collectives of whom I am a part. By exhibiting worked examples that I have contributed to directly, I am with great intentionality, highlighting my “...assumptions, influences, and approaches” as encouraged by Gee, as a pathway to “...commonality, sharing, collaboration, and accumulated knowledge” (*New Digital Media* 39). My motives are that this work articulates theories and practices of media that develop and commend tools by which all peoples may consider the implications of the Digital Age on how we view ourselves, each other, relationships, terms of engagement, and the places we inhabit.

My intentions in exhibiting the particular body of worked examples in this research are not to be paternal or didactic about what constitutes “good work,” but to offer my perspective as well as an invitation for dialogues and debates. I hope that these interchanges ultimately constitute new ideas that bring into focus exemplars that help determine good work according to those who are engaging indigenous convolution media, indigenous technological sovereignty, and culturally-responsive digital media and learning.

Theory-Making, Positionality, and the Validity and Limitations of This Research

This research includes an exhibition of “worked-examples,” which I describe as a body of indigenous convolution media. These worked examples are a collection of art and technology productions including indigenous digital media and learning. The productions exhibited in this research are created by several intercultural North American indigenous artist and technology collectives, all of which I am a contributing member of.

In this research, I have curated worked examples that I have helped to produce. This is because my creative practices are a function of my research methods. I acknowledge that, through some conventional academic perspectives, the objective validity of my theoretical claims may appear to be compromised by my decision to propose my own work as evidence. However, this research is an art-based generative learning-while-doing process combining theory, design, performing, and exhibiting into unified rhetorical actions invoked by conceptual aesthetic and technological ideas.

It is not my intention as an artist, engineer, and theoretician to make quantitative claims about media and indigenous sovereignty. Instead, this research comprises theories and praxes of indigenous convolution media that are designed to function as rhetorics of community engagement. My approach to community engagement is to engender dialogues by using James Paul Gee’s framework for proposing worked examples towards the potential development of an emerging field of inquiry (*New Digital Media* 40-52). To accomplish this task, I have written this dissertation to explain my creative process, ways of thinking, theories, values, assumptions, and productions regarding Tecno-Sovereignty. At its most basic level, this research functions as a rhetorical action designed to engage as

many publics as possible in dialogues with the hope of contributing shared and self-determined theories and practices of indigenous technological sovereignty.

This research applies an art-based research paradigm to explicate my creative process, ways of thinking, theories, values, assumptions and productions regarding Tecno-Sovereignty. Art methodologies scholar Shaun McNiff describes arts-based research as “...the systematic use of the artistic process, the actual making of artistic expressions, as a primary way of understanding and examining experience by both researchers and the people they involve in their studies. These inquiries are distinguished from research activities where the arts may play a significant role but are essentially used as data for investigations that take place within academic disciplines that utilize more traditional scientific, verbal, and mathematic descriptions and analyses of phenomena. (29)” McNiff’s definition describes my research intentions, which are to highlight worked examples I helped to create in order to offer insights that are derivative of the processes and outcomes of my creativity in the context of collaboration.

Although the arts-based and indigenous research paradigms employed in this dissertation may appear unorthodox within traditions of academic research, they are not entirely dissimilar from essential practices common to artists, designers, and many applied scientists working within Western traditions (Dewey 58-81). Furthermore, there are diverse indigenous and Western innovation traditions that include: collaboration; observing; hypothesizing; predicting; testing; and the recirculation of findings back into ongoing cycles of inquiry in order to refine knowledge, designs, and practices (Barnhardt and Kawagley 11-12; Castagno and Brayboy 732; Dewey 58-81; Flower, Long, and

Higgins 49-80; Kawagley 22-32; “Native Science” 133-147). In this research, it is through these spiraling and reflexive processes of inquiry that the production of theories, practices, artifacts, and uses of artifacts emerge.

In addition to processes associated with function and use of mediums and media, the theoretical consideration of aesthetics must also be accounted for within arts-based research. The worked examples in this research demonstrate an indigenous assertion of what scholar Bryan Brayboy refers to, in his course on indigenous knowledge systems, as values and beliefs about what is good, beautiful, and true (“Indigenous Knowledge”).

The worked examples in this research are exercises of indigenous self-determination that produce rhetorics of community engagement through “public performance” (Flower 83-99). These rhetorics are more than just reading, writing and theory: they are infused with other praxes, such as politically loaded public actions operationalized by experiential literacies including sonic and visual modalities. The rhetorics politically appeal to the intelligence and emotions of audiences as a way to challenge all peoples to consider a theory that varying and emergent worldviews diversify notions of beauty, and that, like ways of knowing, these values are not universal.

The aesthetics presented in this research are largely connected to the logics of indigenous knowledge systems. For example, in the exhibition presented in this research, the aesthetics of artifacts are highly rationalized because the collectives who created these works pragmatically establish and position varying notions of beauty as metaphors and semiotic vehicles to contain and deliver indigenous narratives of self-determination based on principles such as respect, relationships, reciprocity, responsibility (“Indigenous

Storywork” 1-2). The methodologies/methods for the worked examples exhibited in this dissertation also parallel those that guide theory making in this research.

Aesthetics and the inquiry methods in this research demonstrate creative designs and practices of indigenous convolution media while also forging new theoretical directions for media and indigenous sovereignty. Within the domain of arts-based research, the validity of the written theories, written descriptions of worked examples, and the worked-examples themselves comprise a unified rhetoric across mediums and media. This unity includes the texts forming this dissertation and, like all rhetoric, the public perceptions of these texts are subject to the authenticity and ethos of the writer.

This research is informed by my personal experiences and academic scholarship. Through the process of this research, my intentions are to honor and recognize that this dissertation is made possible through the application of connected-knowledge methodologies, the circulation of indigenous knowledge systems, and the co-intentional efforts of peoples who form the indigenous collectives⁵ I am part of. Through these acknowledgements, the direction of this research extends outward from indigenous communities, which is differentiated to theorizing from a distance. In this dissertation, I do not speak on behalf of the community I am from, nor do I speak on behalf of the collectives I am part of. I do, however, speak as a connected member of my community and the collectives (or learning communities) I participate in.

⁵ These are collectives whose members are personally and professionally connected to diverse indigenous communities throughout North America, and that work with intentionality to connect narratives of indigenous self-determination both locally and abroad.

My intentions in this dissertation are to speak from the place where I was raised. I am writing from an indigenous mestizo position radiating outward from the Southwestern United States. I am projecting a borderlands and indigenous discourse tied to my perception of self, based on how I was raised by my family/community, and according to my spiritual and ancestral relationship to people, places, and the land I am from.

In my experiences, stereotypical perceptions of mestizo identities are often shaped by various social, political, and economic structures existing beyond the realms of where I was raised. Often times within academic scholarship, I encounter mestizo stereotypes created mostly by scholars who are not from communities in Northern New Mexico – the place I am from. In the following paragraphs, I will disclose my identity to address academic and borderlands concerns with authenticity, and to complicate the stereotypes that have emerged from the processes of policing academic and national borders.

By critiquing borders in defense of my identity, I firstly acknowledge the paradox of advocating for indigenous sovereignty (which is also about constructing borders). I also want to acknowledge the possibility that indigenous borders differ from those created by colonial/imperial nation-states. Perhaps indigenous borders are more porous and flexible — for example, as in pre-Colombian times, when there were no fences or walls. Perhaps within these alternative realities, the identity politics of the mestizo change. Despite border scenarios that, as an individual, I cannot control, I will clarify my identity because it is critical to the methodologies that guide this research, and because doing so aligns with the ethics that my community raised me to embody. While acknowledging the importance of presenting who I am and where I am from, it is also

equally important to acknowledge that the validity of this research does not solely depend upon reader perceptions regarding the “authenticity” of my identity as “indigenous,” but is also dependent upon my motives and intentions as a researcher.

Within academic institutions, mestizos have been and are currently stereotyped by scholarship as hybridized people occupying a puzzling middle space where there exists no ethnic label with which they can clearly identify themselves (Cook-Lynn 338-341; Grande, “American Indian Identity” 345-346; Grande, “Red Pedagogy” 238-240). These narratives cast mestizos as displaced and despairing people who embody multiple cultural discourses, and who often embrace Western concepts of individualism. Stereotypes of mestizos have been produced and perpetuated by both mestizo and non-mestizo scholars alike, and are sometimes positioned as defining racial borders that often cast mixed-blood scholars as pariahs on both sides of racial color lines (Anzaldúa). Unfortunately, Hollywood stereotypes of American Indian “mixed-bloods” are also implicated in reifying these same stereotypes. These stereotypes portray “half-breeds” as impure/inauthentic and untrustworthy/deceitful (Aleiss 8-9).

The irony is that concepts of identity are often created in academia with intentions to complicate and disassemble racial borders, but unfortunately when complexity ceases or borders are constructed, these models become static and overused — sometimes giving rise to new stereotypes. In this research I intend to complicate or decenter mestizo stereotypes despite the vexing aforementioned dilemma that arises through my contributions to the topic of indigenous sovereignty. Within this research, I, as a person, both acknowledge and honor my Native American and indigenous Mexican ancestors

without denying that these roots are infused with colonial ancestral/cultural influences. I embody this heritage without confusion about where I am from, or my capacity to fully commit myself towards contributing to discourses such as “Native” sovereignty.

My identity and position within this research come from my connections to the community I am from, which primarily defines my identity. I am Alcaldeño⁶, a mestizo bearing an indigenous identity constructed by intra-community networks consisting of Native American, Mestizo, and Indo-Hispanic pueblos along the Upper Rio Grande Valley in Northern New Mexico. In my mestizo community, my sense of identity is co-constructed from my actions as an Alcaldeño and my relationships with those to whom I am related — in other words, through the power of my family and community to co-determine with me who I am in accordance with who my ancestors are, where I was raised, and my actions, which are always in relation to my community.

My mestizo background is a mixture of ancestry comprised of Mexican indigenous, Native American, and Indo-Hispanic origins. I was raised in an indigenous mestizo society based on indigenous agrarian traditions in the Upper Rio Grande Valley. The agrarian traditions of growing indigenous foods practiced in Northern New Mexico are largely cumulative emergent Pueblo Indian and indigenous Mexican practices that are specifically developed by way of the lands and waters from which I was born and raised.

As in academia, identity politics exist in my home community; however, back home, questioning a person’s authenticity is nonsensical. What is at stake is an individual’s response to the question: What kind of an indigenous person does one wish to

⁶ Someone from Alcalde, New Mexico, or, more accurately, a person of Alcalde, New Mexico.

be in relation to community ethics, protocols, and expectations (Deloria Jr., *We Talk* 125)? Despite my community's way of being, I find myself addressing the "issue" of "authenticity" because I live in a world that constructs race along with its associated social structures. This activity takes place in many institutions, including academia.

Because of my experiential and scholarly awareness of the ways in which race is constructed, I believe that the realities and constructions of race impact the validity of my research, especially since this work speaks from the positionality of an indigenous mestizo. The validity of my research may fluctuate in accordance with varying reader perceptions of my identity and its authenticity in relation to my claims as "indigenous," a concept that, in the United States, is not always inclusive of mestizos. By raising the topic of identity, I hope to mitigate any loss of validity resulting from identity politics, by explicating my identity and by sharing my perspectives regarding academic and government constructions/impositions of identity politics.

To additionally complicate identity discourses concerning the mestizo, as well as to further articulate my positionality as a mestizo scholar, I argue that, counter to some discourses, many mestizos do not lack deep relationships and indigenous spiritual connections to their ancestral homelands. To the contrary, I argue that their relationships to lands run deep, and children in many mestizo communities are raised to understand that these relationships are something that is not to be forgotten. Despite this worldview, it is possible that, throughout the U.S./Mexican borderlands, mestizos within the United States do experience a sense of displacement — not because they don't have deep relationships to their ancestral homelands, but because access to their homelands is

violently prohibited, such as through the Treaty of Guadalupe Hidalgo, immigration policies, and globalizing policies such as the North American Free Trade Agreement responsible for destabilizing indigenous communities south of the U.S./Mexican border.

In the United States, mestizos remain an unrecognized people, having been denied land rights and thus left with little choice but to fight for civil and labor rights. This reality is addressed by the late indigenous scholar Vine Deloria Jr., who reminded Mexican Americans of the Treaty of Guadalupe Hidalgo, and suggested that mestizos reposition their efforts, based on their treaty with the U.S. federal government, towards sovereignty (“We Talk” 114-137, 146, 211-213). For clarification, in this research I do not conflate indigenous sovereignty with civil rights. Instead, I connect with the position held by members of my home community as they continue to contest the Treaty of Guadalupe Hidalgo with the U.S. federal government; I also connect with the assertion of sovereignty within the Eight Northern Indian Pueblos located in Northern New Mexico.

As a descendent of indigenous peoples of North America, I am not contributing ideas for civil rights, which are predicated on assimilation. Instead, I am writing about indigenous sovereignty. In this research, my understanding of indigenous sovereignty is that it varies throughout the world according to the diverse desires and perspectives of indigenous peoples in determining for themselves how they envision their autonomy as first peoples within the context of varying forms and timelines of colonization. In the case of many indigenous peoples throughout the Southwestern United States, indigenous sovereignty is the right to exercise cultural and political autonomy while operationalizing

this autonomy and its emergent values to foster an emergent relationship with, and to exercise control and jurisdiction over ancestral lands and its resources.

In the previous paragraphs I have stated my motives and intentions, which are opposed to replicating what indigenous scholar Elizabeth Cook-Lynn has critiqued as “mixed-blood” individual-centric stories (Cook-Lynn 340). Despite this critique and the vexing issue of border and identity noise and confusion, I assert my mestizo position in this research to strongly signify, within the political context of indigenous sovereignty, my indigenous identity, while also resisting color lines and stereotypes that suggest I should deny my full heritage in order to prove my allegiances.

To offer final clarity regarding my research positionality, I acknowledge that indigenous sovereignty is different from civil rights movements. This doctrine of difference articulates that indigenous sovereignty underpins indigenous nation-building, which is justified via historical first nationhood and the historical treaty relationship between Native American nations and the U.S. federal government. As indigenous nations, native sovereignty is a resistance towards forces of assimilation by adjacent nation-states, whereas civil rights movements are about attaining racial equality within a nation-state (Deloria Jr., “We Talk”; Wilkins 41-62). I have disclosed my identity to address stereotypes associated with mixed-blood claims of indigeneity, and to clarify that my place-based cultural identity motivates me to do research that can potentially contribute towards the empowerment of indigenous sovereignty, which includes supporting my home community and neighboring communities in Northern New Mexico.

To add further complexity to my positionality, this dissertation exhibits the work of several intercultural North American indigenous art and technology collectives by which I am a participant. This includes my role as an indigenous researcher from the Southwestern United States. Although the scope and limitations of this research hardly reflect the diversity of indigenous peoples throughout the world, or even North America for that matter, the purpose of this research is to contribute a highly focused reference point from which I attempt to contribute toward inclusive dialogues about indigenous media practices during a time of pervasive media technologies, global market systems, and multinational corporate oligarchies.

Population Sampling and Confidentiality

The research in Chapter 5.7 and most of Chapter 6 focuses on culturally responsive digital media and learning for American Indian youth. This digital media and learning research was conducted in a local Arizona Native American community that I refer to in this dissertation as Arizona Indian Community. Within this community, research was conducted at the Arizona Indian Community's tribally operated charter school and at a local community college situated on the community's lands. The academic scholars conducting this research are Yasmin Kafai and Kristin Searle from the University of Pennsylvania, and Bryan Brayboy and Cristóbal Martínez from Arizona State University.

In order to be included in research activities, participants were required to be members of the Arizona Indian Community or attend school at the community's charter school. If needed, our intentions were to include a small number of non-indigenous students who are members of these communities. However, this was not required since all students were Native American. In this research we also made a significant effort to have an equal distribution of male and female participants across a range of age groups.

All of the participants in this research include Native American middle-school students, middle-school teachers who teach at the Arizona Indian Community charter school, and cultural workers from the community's language and culture department. This research was designed to specifically understand the cultural challenges and pedagogical requirements for the design and implementation of culturally responsive digital media learning specifically for American Indian Youth. Although all the inquiries

of this research took place within a specific Native American community, the student research participants came from backgrounds representing a diversity of indigenous ethnic and cultural diversity. For example, there were participants representing various Native American nations throughout the United States. The teachers and community cultural workers who participated in this research were of both Native American and non-Native American backgrounds.

The participants of this digital media and learning research were identified by community partners, and our negotiations with the community led to research that focuses on culturally responsive digital media and learning for middle-school students. The following overview of research accomplishments is largely quoted from Kafai et al., “E2Textiles: Electronic Textile Design for American Indian Youth.”

As researchers focusing on middle school, which is the 7th and 8th grade, we conducted our research in a Native Arts course from March to May 2013, during which we worked with twelve 7th and 8th grade students (9 females, 3 males). Additionally, during the 2013-2014 school year, we conducted three-week digital media and learning workshops within quarter semesters of a Native Studies course that had new student groups per semester. During the academic year, we worked with a total of seventy-six 7th and 8th grade students (47 females, 29 males) over four quarters.

In the case of the Native Arts course, we as researchers designed and taught the digital media curriculum to meet the needs and expectations articulated by the teacher, whereas, in the Native Studies courses, we co-intentionally designed the digital media and learning curriculum with the teacher. Throughout the Native Studies course, we were

responsible for teaching the majority of this curriculum to students with the guidance, assistance, and feedback of the teacher.

At the Arizona Indian Community charter school, the Native Arts teacher was of Native American descent from a different part of the U.S., and the Native Studies Teacher was of Native American descent from a local Native American Community whose peoples are ancestrally related to those of the Arizona Indian Community.

In addition to these courses, we also conducted research within an informal learning setting at two consecutive summer digital media learning intensives at a community college located on the community's lands, where we the researchers co-designed the intensive workshops with the community college's American Indian Program and the Arizona Indian Community's Cultural Resources Department. Within the summer intensives, we the researchers were responsible for teaching curriculums we co-developed with the Cultural Resources Department, while at the same time the core digital media and learning curriculum was supported by local knowledge lectures and activities led by community elders and knowledge keepers.

During the 2013 program, we worked with twenty-seven youth (9 male, 18 female), and during the 2014 program we worked with fourteen 7th and 8th graders (8 girls, 6 boys). In the case of the Arizona Indian Community's Cultural Resources Department, all of our advisors were from the Arizona Indian Community. Within the community college Native American Program, we worked with program coordinators and instructors who were of Native American and non-Native American backgrounds.

In Chapter 5, I will present an overview of the digital media and learning research at the Arizona Indian community as a worked example. The worked example will consist of images of student projects, as well as a final report written by Kafai, Y., Brayboy, B., Searle, K., and Martínez, C. This report was written to conclude a National Science Foundation Computing Education for the 21st Century (CE 21) Grant (#1150150), which funded the aforementioned research. This report presents early conclusions of the overall research based upon an early analysis of ethnographic data that we collected, which includes researcher observations during teacher and researcher curriculum co-development sessions, researcher observations of classroom sessions, student interviews, teacher interviews, and audio/video documentation of interviews and classroom sessions.

In Chapter 6, I will present an analysis of a series of four post-workshop interviews with the middle school Native Studies Teacher, which took place during the 2013 - 2014 school year. My analysis will be augmented with conclusions that Kafai et al. draw from student interviews that took place throughout the entire duration of our research starting in March 2013 and ending in May 2014. For my analysis, I will use a discourse analysis research method. The purpose of my analysis is to understand teacher perceptions of emerging digital media technologies in relation to indigenous knowledge systems and perceptions of local Native American knowledge and traditions.

All of the aforementioned research was conducted in compliance with research protocol (IRB #1212008630), approved by the Arizona State University's Institutional review board, and research protocol (IRB #817066), approved by University of Pennsylvania's Institutional Review Board. This research is also in compliance with a

memorandum of understanding (MOU) professional development grant agreement between Arizona State University Center for Indian Education and a non-disclosed Arizona Native American community. Both the MOU and non-disclosure agreements between Arizona State University and the non-disclosed Arizona Native American community are on record at the Arizona State University Office of Research Integrity.

Prior to participating in an experimental session, paper-based consent forms were given to parents of children. The participants/parents were required to read the form carefully and then sign and date the form if they agreed to participate. The permission forms for parents to sign for both themselves and for their children to participate in the study were explained to potential participants and given to them by either the Principal Investigators or members of the research team to take home and have their parents or guardians read and either approve or disapprove. Parents or guardians were encouraged to discuss participation in the research with their children before signing the consent form. Parents and children were asked to return the consent form to the site within a week where the Principal Investigator collected them. Once participants turned in the signed parental permission form, the assent form was given to them to sign, and they were asked if they had any questions or concerns. They were again told that this was a voluntary study, and that they could initiate or discontinue their participation at any time.

Those members who wished not to participate were still be able to learn and use workshop materials so that they would not be excluded from learning and (or) would not be stigmatized for not being involved. At the time of observations, those members who did not wish to participate were not audiotaped or videotaped, and their work was not

photographed. We did, however, ask that they complete pre- and post-workshop surveys so that it was not obvious among peers who was or wasn't participating in the research study. These surveys were destroyed immediately after they were collected.

A child assent form was also used in the study. The consent forms for the coordinators and mentors were also distributed at each site as well. Coordinators and mentors were told that this was a voluntary study and that, if they agreed to participate, their participation would be confidential. The consent forms for pre-service and (or) current teachers specified that participation in this study would have no bearing on their education or employment status. They were also informed that this was a voluntary study and their participation would be kept confidential.

Throughout the study, the PI, co-PIs, and all related site coordinators closely monitored participants to ensure both their safety and privacy. Data collection was shared regularly via a central repository for field notes, video logs, and artifacts so that the proposed analyses of data could be consistently coordinated at all sites. The central repository exists on a hard drive housed at ASU. Searle and Kafai were granted research affiliate status at ASU and given usernames and passwords to access the password protected hard drive. This data repository is accessible only via a username and password login that was made available only to the research teams and their graduate assistants.

No data with direct subject identifiers will be released. Both a paper file and an electronic file is maintained linking participant pseudonyms/nicknames with their actual names; this list of identifiers is kept apart from the rest of the research and will be exchanged only among the study's researchers and their accompanying graduate

assistants. All workshop sites were in Arizona and were jointly coordinated by graduate assistants (Searle from Penn and Martínez from ASU), ensuring that unanticipated problems and protocol modifications are reported promptly to both IRBs.

Data was collected with digital audio and video files, photographs, design drawings, and through written field notes. Subject identification was done through their first name and/or nickname only. When on site, the video camera memory cards and digital recorders were in continuous possession of the researcher. Eventually, the digital video and/or audio files were downloaded to a password protected external hard drive that was stored in a locked and secure location on the Arizona State University campus. Paper-based records are also kept in a secure location at the Arizona State University campus and will only be accessible to personnel involved in the study.

At the conclusion of the study, data will be retained by the two principle investigators for potential future research; however all data—including audio and video recordings—will be kept entirely secured and confidential. Any further research based on the data set will continue to use pseudonyms, first name only, and/or nicknames to ensure that participants' confidentiality is maintained. Given this strict level of confidentiality, under no conditions could the data become part of the subject's permanent record, be it one of employment or academic status. It will be destroyed after we have finished publications from the project. We expect there will be a time lag of five years after the project is over. Therefore, the data will be destroyed in Spring 2020.

CHAPTER 3

TECNO-SOVEREIGNTY, AN INDIGENOUS THEORY OF MEDIA

Essay 3.1 – Pornographer and the Hollywood Warrior

*The American Jeremiad*⁷, by Sacavan Bercovitch, was originally published in 1978, and recently republished as an anniversary edition that includes a new preface. In this preface, Bercovitch ties *The American Jeremiad* to American events that have unfolded since the time of the book's original publication (xi-xl). Bercovitch's new preface connects his 1978 original publication to the early 21st century by arguing that there remains a strong continuum between Puritan colonial rhetoric and contemporary American values, and that these values influence today's global capitalism as they continue to impact U.S. politics and society.

The American Jeremiad describes American values and illustrates how Judeo-Christian puritanical ritualized rhetorics such as "God's chosen ones" and "pre-destiny" were adapted throughout American history in order to maintain a national narrative of American solidarity built upon a quest for utopia (xii, xvi-xvii, xli). Bercovitch demonstrates how puritanical rhetorics were an adaptable tool and national narrative for justifying the colonization of America, its revolution, Manifest Destiny, imperialism, free enterprise, and its transition to new capitalism and neoliberalism. Through the American Jeremiad, American society has asserted itself as a globalizing force with a belief that it is

⁷ A public or civic protestant sermon designed to create tensions in society based on reality and the promise of idyllic life. Through this tension, the American Jeremiad is a rhetoric used to motivate public action based upon an ambiguous doctrine of fear and promise. This rhetoric was used to build the nationalism required for American colonization, westward expansion, imperialism and an entrepreneurial spirit.

meant to bring justice and prosperity. In this role, it has additionally casted itself as humanity's last great hope (xiv-xv).

Throughout *The American Jeremiad*, Bercovitch presents American values as a discourse with Puritan roots. He shows how this discourse, from the start, was relentlessly reformed, transformed, configured and reconfigured, distorted and contorted in every way possible out of fear, dogma, and divine promise via a people's ambition to justify their immigration, existence, choices, capitalism, and relevance in the world (xii-xiii, 32). These actions resulted in suffering for peoples who were not cultural descendants of those whose heritage was the belief in Christian puritanical pre-destiny.

Bercovitch argues that the uses of rhetoric by the New England colonists was so adaptable and salient within their minds that they easily molded it to explain all phenomena, even when discourse itself led to ambiguity (31-61). For example, when the theocracy of the Puritans failed, there was always opportunity for renewal as the colonists simply reframed their failure by asserting that, since they were God's chosen ones, his wrath upon them would only purify them to once again achieve utopia.

Like America's march from East Coast to West Coast, the practice of an American Jeremiad seems to relentlessly prevail as it continues, into the early 21st century, to assimilate everything in its path. Bercovitch states that even dissent has been brought into prevailing American values as something that enables the nation to progress or regenerate itself (xvii-xx, xxvi). After reading *The American Jeremiad*, I started to think about the ways that metaphors are used in our society to communicate these American values. I also started to think about how media and the rhetoric of applied

science in the United States uses the Jeremiad to inspire the American imagination.

According to Bercovitch, the puritanical quest for utopia would inspire Americans in the late 18th century to conceive of technology's mechanical power as a means for re-imagining the land into a "human divine paradise. (142)"

To exemplify *The American Jeremiad* in action, I will illustrate powerful practices of American rhetoric that started in the late 20th century and that continue to be used today. These practices include the designer encoding of values within the designs of emerging pervasive media, and the uses of media by the decedents of settlers to America in order to inspire and justify the ongoing colonization of indigenous peoples and their lands. I am presenting this evidence to construct an entry-level critical indigenous media literacies framework for evaluating the colonizing aspects of pervasive media.

As illustrated in *The American Jeremiad*, there is an enduring spirit of progress throughout U.S. history. American mainstream society values ideas of progress as a moral entitlement, which is the legacy of colonization. This often appears to be expressed through media depicting romantic messages that claim there exists a pioneering nature to humanity. These worldview projections of pastoral sound and idyllic image in media are linked with manifest destiny, and are found in everything ranging from U.S. history books to Hollywood blockbusters. Somewhere within that range, this rhetoric can also be found in the names and metaphors the National Aeronautics and Space Administration uses to christen its vehicles before they soar into space. To begin the work of constructing an entry-level critical indigenous media literacies framework, I provide the following discourse analysis of NASA spacecraft names.

Within the context of colonization, I introduce the activities of NASA because they are enacted by an American government agency to demonstrate powerful projections of American colonial values, which are central to what motivate American space exploration. The achievements of the American space program are celebrated by America as one of the hallmarks of human progress. This worldview is never more explicit in history than when Neil Armstrong, the first man to set foot on the moon, proclaims on behalf of all humanity, “That’s one small step for man, one giant leap for mankind,” as he steps from the Eagle onto the lunar surface. For Euro-Americans, the Apollo mission to land on the moon was much like the idealized historical narrative of a time when Christopher Columbus set sail into the great unknown to “explore” and “discover.” Armstrong, in a moment of pride and accomplishment, states his assumptions that the activities of Americans (“God’s chosen ones”) are conducted on behalf of all humanity.

In more recent times, NASA sought to inspire the American imagination by stylizing its space shuttle orbiters with names such as Columbia, Discovery, Endeavor and Enterprise; while the shuttle fleet is now retired, other vehicles continue to soar under names such as Voyager, Explorer, Scout, and Ranger. In the U.S., all of these spacecraft titles refer to actions such as investment, security, reconnaissance/surveillance, and exploration. NASA further reifies these values by expressing them in other spacecraft names such as Destiny, Opportunity, Spirit, Faith, and Freedom. In the U.S., these values are normalized in mainstream society: they are abstract and extend American colonial discursive traditions, and are used by NASA to inspire the American imagination.

If we take time to critique these names in the context of colonization, we find they offer deeper metaphorical meanings. Let's review the last set of names again. This time I have placed some examples of these metaphorical meanings in parentheses: Destiny (Manifest Destiny, Norman Yoke), Opportunity (resource extrapolation), Spirit (aggression/leadership), Faith ("God's chosen ones"), Freedom (liberty, individualism, entitlement), and Curiosity (discovering/exploring a "New World").

These underlying meanings are woven so deeply into the fabric of American identity that the historical and ongoing colonial implications associated with these ideas are rarely identified. Even if they are, they are often rationalized as part of what ideologically makes the U.S. a "great nation under God" (the Jeremiad in action)⁸. This is regardless of the subjugation of indigenous peoples that its imperial activities cause. I would argue the majority of Americans unquestioningly believe NASA's rhetoric — except for people who either belong to a minoritized population silenced by these ideas, or who feel disenfranchised, or who are morally troubled by inequities.

NASA's spacecraft names form the foundation for how progress (such as the spending of billions of dollars annually on space exploration) is justified in America. Cognitive linguist George Lakoff and philosopher Mark Johnson cite the implications of metaphors by stating, "In most cases, what is at issue is not the truth or falsity of a metaphor but the perceptions and inferences that follow from it and the actions that are

⁸ As a side note, having grown up in a culture that resists Jeremiads, it is frustrating for me to see the ways that many Americans justify the actions of their nation. Given the examples I have provided in this essay, it is frightening to see how much America will spend to exercise the Jeremiad. How can Native Americans, Mestizos, or other concerned groups overcome something as rhetorically adaptable as the colonizing Christian religious worldview? There seems to be no limits to how this Jeremiad can adapt.

sanctioned by it” (158). Through American space exploration, “progress” unfolds into a higher-level imperial metaphor sanctioning the colonization of indigenous peoples.

In the activities of NASA, it is easy to see how media embodies the values of its creators. In the case of rockets and all types of spaceships, NASA empowers vehicular names as media by demonstrating the awesome power of rockets, spaceflight, and its resolve to do just about anything (like a jet propulsion sky crane lowering a sport utility vehicle on Mars named “Curiosity”) to prove how serious it is about the exploration and colonization of space. So in the case of my analysis of NASA, my definition of media in this essay includes the names of the spacecraft, the materiality of spacecraft and the magnificent power of their operation, and the mass media broadcasting of events associated with space travel. In my definition, the media is the medium itself and the rhetorical demonstration of the medium in action.

To drill down a little deeper, I will now focus on a theory that the media is the medium itself, which is not dissimilar to media theories by Marshall McLuhan who famously proclaimed, “The Medium is the Message.” In the following section, I will present a brief literature review surveying recent academic conclusions regarding the current human historical account of technology, as well as the values that are encoded into pervasive manufactured media. In this essay I will use technology and media interchangeably as a way to reference tools.

The written historical account of technology⁹ gains momentum during the Industrial Revolution. Until recently, early accounts of this history assert that modern technology was founded by Europe and America (Arnold; Halström & Gyberg; Rodríguez-Alegría). In this narrative, the establishment of modern technology in other places outside Europe is framed as an inheritance of colonialism.

During the time of the Industrial Revolution, its associated technologies were viewed by Western society as modern (Arnold 86-87). The imperial concept of modernity was formulated in part by labeling indigenous societies as primitive (87). The label of “primitivism,” constructed by imperialists and colonists, provided industrial nations with the justification they sought in order to assert their technologies as the most “advanced” (Arnold 92, 96; Rodríguez-Alegría 33, 35-36). Recently historians have begun to rethink the history of technology as a response to challenges by indigenous populations throughout the world. Indigenous peoples today are demanding to have their own histories of effective technology (Arnold 86-87; Rodríguez-Alegría 33-41).

In addition to the critique of history by indigenous peoples, historians of technology have come to new analytical conclusions that also call for a new iteration of the history of technology (de la Peña, 919-937; Arnold 85-101; Rodríguez-Alegría 33-41; Long 698-714). Through their efforts to analyze the written history of technology, they have uncovered that past engineers and historians constructed the history of technology by chronicling, their own — in the case of engineers, Western inventions they believed

⁹ In this review of literature I define Technologies as tools that augment the human ability to manipulate facets of a natural and (or) built environment. These tools are often performed within societies to modify objects, mediate relationships, and facilitate all aspects of culture including politics and economy.

revolutionized Western and colonial society (de la Peña 921; Long 701-703). These cited historians argue that this chronicle of technology is devoid of geographical, social, and cultural contexts, and that it privileges an imperial/colonial narrative of technology.

Up until this recent realization, historians did not contextualize the history of technology within social, political, cultural, economic, and bioregional scenarios, nor did they consider how these factors were embedded into the technologies themselves (de la Peña 921; Long 701-703; Rodríguez-Alegría 36). The implications of this are that current historians realize that the human and contextualized history of technology has yet to be written. This is a history with time scales and chronologies that do not necessarily have to correspond to Europe and its colonies. It is a site of research where much work currently needs to be done. To begin this work, technology historian David Arnold argues that historians must reach across disciplines to anthropology for assistance (86, 93-94, 100-101). Arnold suggests this interdisciplinary approach because anthropology has an established practice of trying to understand tools within their context.

Although anthropology may be the primary discipline that has created an account of technologies by humans across cultures and historical periods, anthropologists are realizing that they too must also reshape the technology narratives that their discipline has constructed (Rodríguez-Alegría 33-41). This realization stems from the same drivers that have caused historians to reevaluate historical knowledge. Imperial and colonial centric narratives that distinguish European technologies as more advanced than indigenous technologies have also influenced societal understandings of technology, a concept that according to anthropologist Enrique Rodríguez-Alegría is now largely

disproved by scholars. According to Rodríguez-Alegría, one of the implications of this is the anthropological assumption that indigenous peoples around the world were early adopters of Western and colonial technologies (33-34). Rodríguez-Alegría is working to challenge narratives based on the assumption that indigenous peoples immediately abandoned their technologies to adopt Western and colonial technologies that were, according to Western narratives, more efficient, superior, or advanced.

As a result of rethinking anthropological narratives regarding technology transfer, anthropologists are reassessing human technologies within the context in which they are created and used. For example, Rodríguez-Alegría uses empirical contextual evidence specific to a few cases to demonstrate that aspects of the technology adoption narrative do not accurately represent what historically occurred (37-41).

Rodríguez-Alegría argues that the adoption model is the result of colonial narratives that are taken for granted as factual. He states that the current accepted adoption models are based upon unquestioned notions of logic that argue Europeans were able to colonize indigenous peoples because of their superior technology. This is a claim Jared Diamond also makes in his bestseller *Guns, Germs, and Steel*. Rodríguez-Alegría responds to Diamond by arguing that, in the case of Mexico, it is not necessarily true that Spanish weapons were superior to indigenous weapons, but that the Spanish conquest was made possible by other factors such as disease, military strategies, and the political instability of the Aztec empire (35).

To provide empirical evidence to support his claims, Rodríguez-Alegría uses statistical archeological evidence gathered in Xaltocan, Mexico to demonstrate that the

indigenous peoples of this region continued to use obsidian stone tools during the Spanish colonial era, and that the recent adoption of these tools did not have anything to do with steel tools being more “advanced,” but rather to the fact that they could be easily accessed via a market at an affordable price, and that uses of technologies are also influenced by a people’s access to materials for production (37-41). Rodríguez-Alegría uses his study to advocate for anthropologists to question narratives arguing that indigenous peoples quickly replaced their technologies with “superior” European technologies. He encourages new research based upon empirical support, and claims that a “. . . fantasy of European technological superiority” will collapse under the evidence (36). In this case, Rodríguez-Alegría cites one example of the work that needs to be done in order to draw a clearer focus on the history of technology, as well as how it is a result of social, cultural, political, material, and economic factors. He argues that new empirical models such as the one he demonstrates need to be put in place to in order to fill in knowledge gaps, as opposed to using assumptions that derive from Euro-centric narratives regarding technology.

The recent shift in both disciplines — history and anthropology — to conduct contextualized scholarship about technology demonstrates large gaps in knowledge that must be filled in order to construct an accurate definition of what technology is. These gaps suggest that past Western-centric scholarship as well as colonial narratives about technology have given rise to technology discourses that are driven by dominating cultural values, and are unsubstantiated due to the lack of contextual evidence. To

understand the deeper implications of these knowledge gaps, current dominant cultural values and standard definitions of technology must be taken into account.

Unlike the cited knowledge gaps in the history of technology and the anthropological understanding of technology transfer, there appears to be a more comprehensive body of scholarship that focuses on the Western values asserted within contexts of technology, as well as how these values influence definitions of technology. I introduce several of these values briefly in the following paragraphs to establish a framework for understanding Western ideology in contemporary discourse about technology, and to demonstrate that values are encoded into the designs of technology.

Technological neutrality is the perspective that technology is neutral. What is meant by neutral technology is the idea that there is nothing implicit about a given technology that has social, cultural, political, or economic implications (Moñivas). The idea of technological neutrality suggests that technology does not embody societal values; therefore, a tool is only given meaning by the way an individual chooses to use it. Through this concept, technology is apolitical and the individual maintains control over the tool. Technological neutrality is a perspective that has been empirically invalidated by scholars arguing that technology embodies values deriving from society and culture (313-314). Furthermore, scholars have demonstrated that technology is shaped by politics with a feedback loop illustrating that technology also shapes politics (314-316).

Similar to technological neutrality is the idea of technological determinism, which asserts that technology can shape society, but that it in and of itself is not shaped by society (Mackay & Gillespie 686). Like technological neutrality, this idea is also refuted.

In the case of technological determinism, sociologists argue that design processes play a significant role in determining the outcome of a particular technology (685-709). They argue that technology does not implicitly embody societal factors, but that technologies are a function of societal factors (social, political, economic, etc.).

The idea of technocracy has emerged from the arguments against technological neutrality. Technocracy is the idea that technology is designed to respond to political challenges (315). In this framework, technology is therefore thought to be political: it isn't only politics that imposes the need for new technology, but it is also that technology imposes its own behavioral requirements for performance by users and creators of technology (Lessig, *Code and Other Laws* 198-199, 205-207). This is a theory that has broad colonizing and emancipatory implications for indigenous self-determination and sovereignty. Because technology is political, it gives rise to the idea that society must choose and design its technologies according to the ways it cares to emerge.

Techtopian ideas derive from philosophies of utopia where technology becomes tied to notions of progress (Kozinets, 869). Through this system of values it is believed that human perfection can be achieved through applied science. This belief assumes that technological progress is a moral endeavor because human improvement is a function of advancing technologies. This idea continues to reflect societal thought despite massive technological disasters throughout the 20th and early 21st century,

The Green Luddite perspective recognizes utopian notions of technology in the sense that it views the advancement of technology as linked to social progress (Kozinets, 869-870). But it also frames technology as resulting in the unintended degradation of the

environment and cultural traditions. This perspective has given way to activist movements that often oppose technology development. These values, like those within the techtopian perspective, are also driven by a sense of morality.

Like techtopianism, which values technology as a social good, the work machine perspective ties the development of capitalism to that of technology (Kozinets, 870). Work machine values posit that advancements in technology will lead to economic growth and development. Like the other perspectives on technology mentioned so far, work machine values also have tensions. One of these tensions is that this value system is cited as having given rise to the dehumanization of people exploited as factory labor.

According to Robert V. Kozinets, a professor of marketing, one of the latest technology perspectives to emerge is what he refers to as “techpressive,” which is the idea that entertainment can be acquired through uses of technology (Kozinets, 870-871). He attributes the rise of these values to the increase in popularity of video games among youth. Kozinets cites that technology that encourages play has led to a fetish of technology. He argues that technology as a form of escapism has also led to societal cynicism that technology can become addictive and can lead away from utopia.

Society currently asserts of all these perspectives/value-systems to define a mainstream or normative discourse of technology. There are some members of society that lean toward extremes in terms of adhering primarily to one of the aforementioned perspectives; however, according to Kozinets, many members of society position themselves between these value-laden nodes.

James B. McOmer, an assistant professor interested in the rhetoric of science and technology, argues that technology is the expression of culture, and that it is created to “. . . perform tasks and create immediate particular, and personal and/or competitive advantages in a given ecological, economic, and social context” (138). Through this definition he argues that technology cannot be autonomous from culture. He also argues, despite the fact many scholars have shown that technological autonomy from culture cannot exist, there still seems to be a strong public belief that technology is neutral.

In his interest to understand the relationship between social perspectives about technology, McOmer cites that “[f]ew have attempted to explain how defenders of technological development earn public acceptance for their claims” (138). Here we are left with yet another knowledge gap with respect to technology discourse. To conclude a comprehensive list of value systems cited by various scholars who are studying societal perspectives of technology, McOmer presents a system of values that strikes even closer to the heart of technology discourse in society. This is the discourse of education. The following is a quote from McOmer who presents the ideology of “Technology as Novelty,” which also encapsulates the definition of technology in the way that the word is commonly used by contemporary society:

A headline in the *Chronicle of Higher Education* read, “Survey shows record number of professors use technology in their teaching” (DeLoughry, 1996, p. A17 cited by McOmer). Such a use of technology makes little sense according to either definition de-scribed above. According to the first, the classroom is a technology. According to the second, classrooms have been pervaded by technology for at least a century. On other occasions, of course, readers will recognize the technological dimension of the familiar. Yet most readers of the *Chronicle* will know that the headline refers to the most recent developments in instruction—distance learning, the Internet, multimedia, and other new communication technologies. In much popular discourse, technology refers

simply to the newest or latest instrumental products of human imagination, and especially to devices not yet widely available or understood (143-144).

My intentions for assembling this review of literature is to show how Western centric perspectives/values of technology shape the discourse that drives our definitions of technology, as well as the discourses and values embedded into the technologies themselves. What this review of literature illustrates is that there are many gaps in scholarship, and this necessitates the formulation of a scholarly definition of technology. I argue that, due to this lack of definition and to the extensive gaps in scholarship, society continues to formulate and exercise perspectives that extend outdated and unjust rhetorics and values tied to colonization, mass production, and the digital age. Unfortunately these ideologies remain predicated upon Western cultural superiority and dominance over indigenous cultures throughout the world.

More glaring than the multiple gaps in scholarly work cited so far is the absence of indigenous tools framed as modern or contemporary technology. This is despite the fact that indigenous technology is currently in use, new technologies are being innovated by indigenous peoples, indigenous technologies are meaningful to peoples throughout the world, and they have been appropriated and applied by Western societies as best practice solutions for economies, politics, culture, production, particular geographies, etc. Even though indigenous populations have innovated technologies that are culturally meaningful in the early 21st century, in my further review of literature regarding the “culturally responsive” technology education in Native American schools, I am seeing the normative value systems described above, as opposed to alternative perspectives that

may emerge from an indigenous discourse (Robyn; Richardson & McLeod; Allen, Resta, & Christal; Lameman, B.A., Lewis, J.E., Fragnito, S.).

To understand the ongoing role of technology discourses to assimilate Native Americans and diverse indigenous peoples throughout the world, I propose a scholarly investigation to understand how an indigenous technological sovereignty might be operationalized in order to mitigate dominant and normalizing discourses of technology. Throughout my review of literature, I was unable to locate any scholarly work whatsoever on this topic. I argue that pursuing this path of research is critical to the self-determination of indigenous peoples in the 21st century.

The lack of a human history of technology, ongoing narratives about Western technological superiority, and Western value systems that continue to drive and normalize technology discourse hypothetically occlude indigenous self-determined capacities to recognize the need to critically engage with emerging pervasive technology, let alone critically engage with these technologies in ways that are “culturally responsive” and “culturally sensible.” I have presented the aforementioned literature review of technology history and value-laden technology perspectives in order to render more explicit the discourses that influence societal perceptions of technology around the world. I argue that with this knowledge we can begin to deconstruct perceptions of technology for ourselves.

Deconstructing and reassembling rhetorics of technology and reverse engineering pervasive media are the first steps in critically engaging technology, and for exercising indigenous technological self-determination and sovereignty. In addition to these

strategies for recognizing influential dominating perspectives in technology discourses, I will now briefly present and analyze two case studies of media that use these value-laden technologies to deploy colonizing narratives that assault indigenous self-determination and sovereignty. These assaults are launched from one of the most powerful manufacturers and distributors of stereotypes on Earth: the movie production studios in a place called Hollywood.

Film and media studies, ethnic studies, and gender studies scholars have largely critiqued representations and stereotypes of indigenous peoples (Aleiss; Bataille; Hilger; Rollins and O'Connor). At this point, it is well known throughout society that Hollywood productions are a multi-billion dollar a year industry, and that these productions are largely rendered via character archetypes and ethnic stereotypes. Some of the originally mass distributed Hollywood productions were those of the western genre in film. Many of these films deployed narratives built around the cowboys vs. Indians trope, where the cowboys were mostly cast as the good guys, and the Indians as the bad guys (obstacles of westward expansion), or the cowboys as the good guys and the Indians as the noble savages, or the vigilante cowboy with his trusty Indian sidekick (Aleiss 59-80; Deloria Jr., *We Talk* 33-34; Hilger, *From Savage to Nobelman* 64-73). Despite the many ways Indians were cast in these films; one thing that remained consistent was that Hollywood represented Indians as wild, primitive, and uncivilized monosyllabic savages who often couldn't seem to grasp the concept of article words in the English language (Bataille 1-9; Deloria Jr., *We Talk* 33-35; Hilger, *The American Indian in Film* 1-5).

These one-dimensional representations of Native Americans not only seek to stereotype Native Americans for a movie going majority white audience, but also to hijack and control representations of indigenous peoples in the media as a way to maintain a status quo justified in dispossessing indigenous peoples of their lands, identities, and cultures (Jojola 12-26). Hollywood stereotypes were constructed by freezing indigenous peoples as relics of the past, and romanticizing them as primitive, supernatural, pure, and noble beings — not human beings, but either less than or greater than human (Deloria Jr., *We Talk* 33-44). In both cases, indigenous peoples were remade in film in ways that were convenient to their oppressors concerns, and were not constructed in ways favorable to indigenous peoples.

As liberal political correctness seeped into the popular consciousness of Americans in the 1990s, Hollywood, according to film scholar Michael Hilger, pulls from the 1950s film *Broken Arrow* (a film that proves the commercial viability of indigenous peoples as main characters), by giving audiences the critically acclaimed *Dances With Wolves*. However despite Native American lead roles in more recent films, the old Hollywood Indian tropes persist (Hilger, *From Savage to Nobelman* 224-227).

At the turn of the century, during a time when massive anti-Mexican immigration sentiments were at an all time high in America, director Mel Gibson, also decided to resurrect some of the old Indian Hollywood tropes by making his own cowboys and Indians film. Gibson answers the call of *Dances With Wolves*, by casting indigenous peoples in all the lead roles in *Apocalypto*, which are roles depicting indigenous characters. This time, to make his film marketable to the American public, he decided

that, rather than turn his stereotyping camera upon Indians of the American variety, he would instead point his camera at Indians of the Mexican and Guatemalan variety, namely the Maya, in his blockbuster film *Apocalypto* (“War and Cinema”).

What Gibson does is superimpose his masculine pornographic obsessions with graphic sadistic violence upon the classical Mayan civilization without any regard whatsoever for historical accuracy (Arden; Freidel 36-41, Kolodny 22-25). In his film, he misrepresents Classical Mayans as having cultivated depraved civilizations guilty of committing mass genocide against other local tribes via grizzly rituals entailing blood sport style human sacrifices (Cite Kolodny 23). These sacrifices depict a Mayan holy clergy and royalty exerting power and authority by ripping still beating hearts out of victim’s chests, and then sending their heads rolling down the steps of Mayan pyramids.

One of the significant properties of *Apocalypto* is that the cinematic technologies employed by Gibson yielded a high definition production that projects a hyper-real quality, or hyperrealism, something that is further enhanced by the screenplay which is written entirely in Maya, Yucatán. In Gibson’s film and countless other productions, Hollywood demonstrates its abilities to create moving images that virtually leap off the screen or that increasingly feel like a window into reality. In the case of *Apocalypto*, Gibson used cutting edge cinematic technology to simulate a re-imagined history. For example, the Mayan city depicted in the film looks so convincing that it could be thought of as depicting a real historical place, and perhaps an accurate representation of history (Arden). As Gibson’s movie conjures hyper-real illusions, it continues a Hollywood tradition of presenting society with inaccurate Indian tropes (Cite Kolodny 25-26).

Gibson's ability to conjure these illusions has the capacity to influence audience perceptions at newly unprecedented levels, to the point where audiences often regard film as truth. Plenty of evidence for the potency of Hollywood illusions as reality became salient on the day of the 911 attacks when citizens had a difficult time understanding if they were watching a Hollywood movie or an actual live event. This was partly because the 911 media coverage was also produced, similar to Hollywood productions, but also because Hollywood productions convincingly produce hyper-reality.

Unfortunately, media such as Gibson's continues to provide audiences with the Indian tropes and stereotypes they need to justify colonization. To make matters worse, there is no archeological or indigenous historical evidence that the Maya conducted human sacrifices at the scale depicted by Gibson's pornographic fantasies, and that Gibson seems to have got the Maya confused with the Aztecs (Arden; Kolodny 23). Unfortunately in *Apocalypto*, the context for ceremony is imagined by Gibson, which casts the Maya as a barbarous society in decay. To conclude the "shock" of his narrative, Gibson provides his audiences with "awe," — or more accurately an "a-ha!" moment: enter the cowboys. In this case, the cowboys are Spanish conquistadores and members of the Catholic clergy landing off the coast, and of course most of us are aware of the violence and genocide committed by the Spanish in the name of God, and in their lust for girls, gold, and glory.

Gibson's hardline Catholic message to his audience: This savage and rotted (Mayan) civilization in decline deserves to be conquered by the Spanish, and furthermore needs to be disciplined in accordance with Christianity in order to purge it of its unholy

ways — Gibson’s privileged critique of the United States under the Bush administration, which he superimposes upon the Maya by colonizing their history and representation (Arden; Kolodny 22, 32; Spence 492, 497, 500).

Colonization is a ruthless process, and media, including film, has been a brutal weapon for distributing fictions and stereotypes with harsh consequences. When the Spanish arrived upon the Yucatan and Guatemala, they learned that the classical Mayan cities had long been abandoned. Historically, there was no classical Mayan civilization at the arrival of the Spanish as depicted in *Apocalypto*. Yet Gibson’s images may convince some moviegoers that *Apocalypto* is historically accurate. Then again, maybe similar cities, like what Gibson depicted, did exist during the Maya Postclassic period as argued by anthropologist and *Apocalypto* movie consultant Richard D. Hansen who critiques some scholars as implicated in distorting history through “revisionist” and “aboriginalist” discourses (180-185). According to Hansen, the city depicted in the movie reflected Postclassic cities “. . . such as Cobá, Oxtankah, or Ichpaatun . . . (158)”

For the purposes of highlighting *Apocalypto*, Gibson’s generated controversies are not ultimately what’s at stake in the argument I am trying to provide, and nor am I asserting that filmmakers like Gibson should not make movies about Indians because they are not Indian. To clarify my intentions, I am trying to articulate that regardless of whether Gibson is a friend or foe of the Indian, or whether he is ignorant or educated, whether he is a racist and anti-Semitic or just drunkenly stupid and sorry¹⁰, whether his movie is serendipitously accurate as he claims, or whether it is radically inaccurate, the

¹⁰ According to the New York Times, in July 2006, Mel Gibson allegedly made a series of malicious anti-Semitic comments while being arrested on a drunken-driving charge.

point is that the media and medium is powerful for generating public discourses, controversies, and perceptions (Aleiss; Bataille; Hilger; Rollins and O'Connor).

Because of media's ability to generate rhetorical power, I am arguing that it is necessary for indigenous peoples to gain access to and exercise their own versions of these and other technologies in order to create and distribute their own self-determined media — and, yes, perhaps even their own self-determined controversies based on their own creative fantasies. Indigenous self-determined media is a key component of indigenous sovereignty in today's age of ultra-fast electronic media.

Another example of hyper-real Indians and an example of the use of the Hollywood Indian trope is James Cameron's science-fiction fantasy film *Avatar*. As opposed to my presentation of Apocalypto, this time I will critique the content of media. I will start out by underscoring the fact that, at the time of its production, this film was the outcome of major breakthroughs in media technology, both embodying and depicting many of the Western values about technology that are described earlier in this essay. As the film technology embodies and encodes these values, the technology itself is also a meta-discourse of other breakthrough technologies depicted in the film, including remote control organic bodies, or "avatars," whose genetic makeup is that of the indigenous Na'vi of the planet Pandora. Not only does the film show human beings inhabiting these "avatars" via remote control, the director James Cameron created technologies allowing human actors to control the same digital avatars, represented as the real avatars on film.

Cameron cleverly set his movie about indigenous peoples on a fictitious planet, yet his figured world of indigenous peoples was uncannily made in the image of

whiteness (utopian fantasies of idyllic nature in which indigenous noble savages live in perfect harmony with the land and each other), just as many other previous imperial depictions of indigenous peoples have been represented in past Hollywood productions (Alessio). It's funny how, through Cameron's imagination, colonial aesthetics of indigenous peoples have now been superimposed upon a fantasized alien race. What's not funny is that he fails to complicate the issues of colonization when a colonizer alters and experiments with the genetic makeup of indigenous peoples.

Although the film lacks a sense of originality in re-imagining the Indian on another planet, the story is sympathetic to the perspectives of indigenous peoples and their violent experiences with colonization, yet like Gibson, it once again uses narratives of indigenous people in order to impose another critique of the United States and corporations during a time of infinite war on terror (Alessio). *Avatar* casts the colonizers as the bad guys by highlighting their unscrupulous colonial motives to steal and extract resources that don't belong to them, using military force if necessary. Because of Cameron's compassion, or affirmation of guilt, he seemingly constructs a narrative, through his imperial lens that favors an indigenous perspective of colonization. However, despite Cameron's guilt or sympathy and compassion for indigenous peoples, he ends up hijacking this narrative by empowering a white male protagonist, via the avatar, as the hero and savior of the blue indigenous peoples called the Na'vi (Alessio). Then again, maybe perhaps Cameron never had any guilt or sympathy, and his motives were to use Hollywood Indian tropes to construct his critique of the United States and corporations.

In the movie, it is clear that idyllic and magical, yet scientifically explainable, indigenous knowledge and ecological life forces eventually trump the human colonizer's technology, leading me to ask: How does a foreigner of the colonist variety suddenly master and command the ancient knowledge and practices of the Na'vi better than their own life-long indigenous warriors and knowledge keepers? Yes, in the movie, the protagonist Jake Sully learns a lot from the native princess he eventually falls in love with *à la* Disney's Pocahontas. However, there remains no indigenous logic to this narrative, only a colonist's fantasy of a noble-savage spiritual prophecy. Perhaps any indigenous logic is usurped by a colonizing logic of guilt, because despite guilt, Cameron on the edge of a precipice cannot take the transformative leap of absolution. In other words, in the end he cannot help himself but to assert the historical pattern of *War and Cinema* to re-inscribe colonial power (Virilio).

The most interesting thing about *Avatar* is the possibility that James Cameron himself may have been fooled by his own hyper-reality. This happens when he decides that he is the white savior, Jake Sully, in real life as he tries to stand up for the environment and indigenous rights in the Amazon (Barrionuevo; Duke; Phillips). In doing so, Cameron parachutes into the Amazon and is treated well in accordance with indigenous hospitality, even though the tribe's people don't know about his celebrity (Barrionuevo, Phillips). Despite Cameron's intentions to help, he fails miserably to stop the construction of hydroelectric power plants that are displacing Amazonian indigenous populations who have been living a life of unfettered self-determined sovereignty since

time immemorial (Phillips). Even though Cameron, through his failure, learns of the farce of Jake Sully, he remains as determined as ever to direct an *Avatar* sequel.

Up to this point, I have presented, from an indigenous vantage, the exogenous values associated with and encoded into foreign pervasive media, and I have demonstrated the deployment of these tools for the creation of public controversial discourse and colonizing media. In this final example, I will provide a discourse analysis of a video game cast in the Hollywood classical western genre to demonstrate the increasing sophistication of colonizing media to persuade audiences toward continued violence against indigenous populations. In this case, audiences are no longer spectators of cinematic violence, but instead embody the violence themselves through a cowboys and Indians shooter video game entitled *Red Dead Redemption*. You can probably guess that in this game the cowboy is the shooter, and, yes, a significant number of his victims are indigenous peoples — both Mexicans and Native Americans. The purpose of this discourse analysis is to draw conclusions regarding the corporate function and social implications associated with the racial stereotypes and overt depictions of racism that take place throughout the game.

Red Dead Redemption is a video game produced by Rockstar Games (2010). It is regarded by many gamers as one of the greatest sandbox¹¹ games produced to date. The New York Times credits Rockstar Games for creating the first video game to successfully articulate the Wild West genre (Schiesel). Furthermore the game is recognized as a noteworthy contribution to the genre when, according to the LA Times, westerns are

¹¹ Also referred to as open world games. In these games, a gamer has the ability to go anywhere within the game environment.

considered " . . . all but dead . . ." (Fritz). In Rockstar's effort to revive the dead, or at least create some zombie version of the old Hollywood westerns, it has produced a cinematic game world inspired by the iconic Clint Eastwood Spaghetti Westerns. Examples of these films are *A Fistful of Dollars* and *The Good, Bad, and the Ugly*.

To create *Red Dead Redemption*, Rockstar games employed an estimated 500 people. Its production took the company five years to complete at a whopping \$80 - \$100 million dollars (Schiesel). Despite this astronomical cost, the game's publisher posted earnings that show *Red Dead Redemption* generating profits in the tens of millions of dollars year after year since its release. According to previews, reviews, and blogs, *Red Dead Redemption* is described as a cutting edge epic video game bearing the excitement and familiarity of the Wild West genre (GamesTM; Fritz; Gaylord; Schiesel).

Like all Wild West films, the American Cowboys and Indians myth continues to be a theme in *Red Dead Redemption*. The game's success and popularity defies the idea that today's political correctness may be one of the reasons why the genre no longer survives in Hollywood. In the past, these films were predicated upon dominant cultural constructions of Indian, Mexican, Black, lower class White, and Irish identities.

These constructions depict all of the above as the "bad guys." In the land of Hollywood, these people are losers, sore losers, followers, savages, noble savages, loyal subordinate companions, lazy, drunk, dirty, bandits, clowns, prostitutes, raiders, malevolent, unintelligent, panhandlers, and never good enough with a gun. These are all the necessary elements for the creators of Hollywood Wild West films to justify people of color as ideal targets for extermination by heroes like John Wayne. In these movies,

white Protestant male archetypes are also constructed in the image of how the producers of these films wished to view themselves. These hyper-masculine characters are always the good, moral, and righteous protagonists who tame the Wild West by spreading peace, prosperity, and Western civilization throughout the frontier while using bibles, guns, and grit. In terms of the white Protestant female archetypes, these characters are usually used as victims of rape by savages, the moral compass of the hero protagonist during times that his morality strays, and are used to represent the domesticating force of civilization that the hero is trying to protect and spread.

In *Red Dead Redemption* Rockstar seeks to create their white protagonist John Marston as a more complex version of this white ideal character by making him a former outlaw with a very questionable past. Even though he has this past, Mr. Marston turns out a moral and ethical person. He is a righteous man, and we feel sympathetic to him because he grew up an orphan. John is the son of a prostitute who died while giving birth to him, and his father was a Scottish immigrant with a penchant for drinking.

Rockstar tries to further complicate this protagonist by providing the gamer with the choice to determine whether he is ultimately a good guy or not. Yes, there are just as many opportunities for the player to play him out as a bad guy, but there are very few suggestive game mechanics to encourage this. Instead, the function and option mostly just exists. Furthermore, Rockstar makes the game more prohibitively difficult if the gamer deviates from his intended stereotype (a cold-blooded killer with a heart of gold).

Rockstar has designed the game so that John Marston ultimately becomes the stereotypical white hero they want to see, even if this means that the gamer has to be

coerced by game penalties and very difficult challenges should the gamer seek to subvert Rockstar's intentions. To be fair, you as a player can still make this happen, but the game will work against you in its effort to encourage the player to fall in line with their intentions for the character. In fact, one may argue that Marston is such a typical Wild West hero, and that he (a lone ranger) may even prevail with the help of an Indian sidekick like Tonto (alias Nastase), who uses his Indian sensibilities to help track even the most illusive of fugitives (Deloria Jr., *We Talk* 35-36). Indeed, westerns both classical and contemporary are a far cry from the cultural expectations associated with political correctness and cultural awareness.

Within the political correctness of the United States, I argue it is much harder for Hollywood to produce Westerns because the mythological figured world of the Wild West is based on overt racial archetypes. This isn't because I believe that today's society is less racist than it was during the Hollywood era of the Western genre; the difference is that today Americans prefer discourses of racism that are more rhetorically sophisticated. Here I am referring to discourses capable of deploying more covert expressions of racism¹². Despite this, *Red Dead Redemption* and its overt displays of racism shows us that the Wild West genre still captures the American imagination.

In their attempts to proliferate popular culture, Rockstar Games does not waste time establishing their discourse. Starting from the opening trailer of *Red Dead Redemption*, strong racial stereotypes are immediately established. Never in the history of westerns will you find a media production with more overt depictions of every kind of

¹² Covert or overt, both these expressions are effective at constructing class hierarchies in America.

racism imaginable. And this is toward every ethnicity depicted including white people, but only those who are of lower class status.

How then does *Red Dead Redemption* manage to pull off one of the biggest selling westerns in today's society? Is Rockstar Games using the medium to raise awareness about racism, or is Rockstar Games appealing to America's xenophobia? Is Rockstar trying to provide gamers with experiences that model a sense of the "real" Wild West? Or are they doing something else altogether with their discourse? To answer these questions, I will provide a discourse analysis that offers some conclusions based on the following transcriptions taken from the opening trailer scene of *Red Dead Redemption*. This scene presents dialogues that depict racism.

Red Dead Redemption protagonist John Marston is escorted by federal agents onto a passenger train at a station in Blackwater. Mr. Marston is a former bandit who has left his life as an outlaw. He is married and has a son, but recently lost his baby daughter. Marston is a survivalist with a moral code, and is a sharp shooter who has settled into an honest life of family and farming.

The year is 1910 and the game takes place in the Wild West at a time when things are changing. The railroad and other modern technologies are bringing about new developments to the American frontier, including settlers, towns, commerce, and federal law. Meanwhile and as a result of this, the era of the cowboy is drawing to a close.

After trying for three years to raise a family and forget his outlaw past, John Marston is kidnapped by federal agents who hold his family for ransom. In order for Marston to find redemption for his past deeds and free his family from federal custody,

he must hunt the antagonist Bill Williamson who is described by Marston as someone who was once his "brother in arms." Marston used to run in a gang with Bill Williamson, Javier Escuela, and Dutch Van der Linde. Now federal agents have sent Marston across the American Frontier to bring these outlaws back dead or alive.

In the opening scene, Marston is in the town of Blackwater. He is escorted by two federal agents who put him on a train that will travel across the frontier to the town of Armadillo. Mr. Marston reluctantly boards the train, and only does so for the sake of his family. He knows in his mind that he has no other choice. Shortly after Marston boards, a scene cuts to the interior of a passenger car as the train begins to move. At the start of this scene, the camera frames passengers with Marston seated amongst them. He has the look of a man with much on his mind.

Suddenly, two genteel elderly women who are sitting behind Marston start to chat. This disrupts Marston's intensity. These elderly women are well dressed and appear to be from an upper class background. As they begin to speak, the camera pans to Mr. Marston with the women's conversation very audible, suggesting that he is listening to them. The following is their transcribed dialogue:

Section 1. (Both Mrs. Bush and her Friend appear to have southern accents.)

Mrs. Bush Friend (who is female):

WELL I for one (intonation rise with louder vocal dynamic) /

am grateful Mrs. Bush (intonation fall) /

that they are finally bringing civilization to this SAVAGE land (intonation rise and fall

starting on the word "to") //

Mrs. Bush:

I could not agree with you more my dear (intonation consistent) /

My daddy SETTLED (quick intonation rise on word “settled”) this land /

and I know he'll be lookin down on us PLEASED on how WE helped the natives

(intonation gradually falls throughout the sentence) //

Mrs. Bush's Friend:

YES they LOST their land (heavy intonation rise with louder vocal dynamic) /

but they GAINED (rise and fall intonation on the word gained) access to HEAVEN

(intonation fall on the word heaven) //

The video now cuts to a shot that frames a preacher and a young girl named Jenny who are both sitting in the seat in front of Marston. You can see Marston sitting behind the preacher and girl, and by the shifting of his eyes the viewer is cued in that he is also eavesdropping on the conversation between the preacher and girl.

Section 2.

Jenny:

but father /

do you mean that unless an innocent receives communion? /

they're DESTINED to go to HELL? //

Preacher:

uh // (Young girl now interrupts before preacher can answer)

Jenny:

that HARDLY seems fair//

Preacher:

what I MEAN to say JENNY /

is that there is a great deal of difference between an INNOCENT/

and a SAVAGE // (The preacher gestures toward the window looking out beyond, as he articulates the word "savage.")

Jenny:

I NEVER thought of it that way //

The camera frames John Marston who's now listening to the elder women behind him.

Section 3.

Mrs. Bush's Friend:

yes they LIVE like animals //

but their [her voice gets drown out by music and the train as it enters a tunnel] //

Section 4.

After the train emerges from the tunnel, it begins to descend into a large desert valley. During this time Jenny explains to the preacher that “. . .not only do people have motorcars . . .” but that soon people will also be able to fly. The preacher paternally dismisses what Jenny has to say, and explains to her that only angels are capable of flight. Jenny continues to insist that people can fly, but the preacher tells her that he doubts what she is saying. After this conversation, the scene closes with one more exchange by the two elderly women sitting behind John Marston.

Section 5.

Mrs. Bush:

APPARENTLY /

Mr. JOHNS wants to run for GOVERNOR //

which is why he's SO concerned with CLEANIN up the STATE //

Mrs. Bush's Friend:

NATE /

JOHNS // (As she nods her head up in a dismissive way)

Mrs. Bush:

Yes //

Mrs. Bush's Friend:

HIS family is nothing but HILLBILLY trash /

that CAME here after the war //

I DON'T WANT to be JUDGMENTAL /

but this STATE should not be RULED by such a DISCUSTING family //

a family (pause) WITHOUT CLASS //

Mrs. Bush:

Apparently /

the Johns family have made a LOT of money /

and he has a lot of FRIENDS in POLITICS //

Mrs. Bush's friend:

Mrs. Bush /

MONEY /

isn't everything //

there are many things money cannot buy //

Mrs. Bush

It seems money CAN /

buy voters though //

When focusing on these conversations, it becomes clear that the deictic “they” in line 3 of section 1 requires us to fill in context that Rockstar Games has assumed that we the audience take for granted. When using the filling in tool¹³, there are many different ways that we can think about what the word “they” refers to. Here are a few ideas: (a.) those who are developing and transferring technology, (b.) schooling/formal education, (c.) pioneers or settlers, (d.) law enforcement, (e.) entrepreneurs, (f.) Christianity.

All of these elements of Westward Expansion and Manifest Destiny are depicted in *Red Dead Redemption*, and they provide us with a great deal of context. In this discourse, Mrs. Bush’s friend is likely referring to all of the above. Again, this is consistent with the context of the video game that shows all of these elements being established in the game’s fictional early 1900s Wild West. Consequently, these new changes cause many tensions to flair up between archetypes in the video game, as the land, the construction of place, and its use become contested between different factions.

¹³ According to Discourse Analysis James Paul Gee, the “filling in” tool is a technique for trying to understand what people are trying to narrowly or specifically say with they language, as well as what they are trying to accomplish with their language. Although this technique is difficult to execute and requires practice, Gee explains that to use this tool an analyst must consider what the speaker has said in relation to the context in which it was said. So in other words to execute this tool an analyst must use context to fill in meaning as a way to fully understand what a speaker is communicating (*How to do Discourse Analysis* 12).

Throughout the game, the player will see people jockeying for power and using identities as a way to leverage power, and to prevent others from attaining it (religion vs. science: see Section 4, men vs. women: see Section 6, critical thinking vs. religious dogma, see Section 2, Manifest Destiny vs. Native Americans: See Section 1, old money vs. new money or the collapse of the social sphere: See section 5, U.S. vs. Mexico, nativists vs. immigrants, etc.). In *Red Dead Redemption*, we step into an immersive and fictional digital sandbox to experience a convincing Wild West, as if we were experiencing an actual time and place that could easily be misinterpreted as a historical documentary for “the way things really used to be during that time¹⁴.”

Current technology is now allowing us to experience levels of cinematic expression in video games like we never have before. However, this technology still has more development to go before characters can produce the nuances of human expression we see in cinema. Because of this, the characters appear to be mechanically flat in their human expressions, but the technology is advanced enough to provide audiences what they need in order to fill in the gaps that are missing. This provides gamers with enough granularity to construct complex mental models of the characters that I am assuming align well with author intentions.

From this trailer scene, we can see that the protagonist John Marston is a complicated man. His shifty eyes and deep gaze tell us that he is thinking about his past, weary about the future — he is driven by the ambition to set things right with his family,

¹⁴ This is a common argument made by blogging gamers who try to defend *Red Dead Redemption* against those who are interested in challenging Rockstar Games’ intentions regarding their depictions of racism in the game (“Racism/anti-semitism”; “Racist or Realistic??”; Byrne, 2010).

and is suspicious of the dialogues that are happening around him. We get the sense that he is a critical thinker actively reflecting on what other people are saying, and perhaps he is literate. Marston's education is later revealed in the game when you hear him use many Latinate words as part of his vernacular. He is criticized by enemy Bill Williamson who tells Marston, ". . . you always were one for fancy words." Evidence that Marston is a critical thinker is that he makes value judgments throughout the game in opposition to the prejudices many who are around him openly express.

There is a tension here because, although John Marston is an educated critical thinker, he is also a coldblooded and indiscriminant killer who will kill or apprehend anyone necessary to get to the outlaw he seeks. This is whether Marston chooses to be a good guy or a bad guy. By looking at this tension through the lens of making it strange¹⁵, we can see Mr. Marston's complexity: he leads us to believe that he is an intelligent critical thinker with a moral code, yet he never bothers to analyze why so many of the outlaws he has to kill happen to be people of color.

Perhaps this condition manifests itself in the players of *Red Dead Redemption* — this is to say unless a player of the game happens to be a person of color, or a critical thinker! Perhaps this is the major site of struggle for the writers of *Red Dead Redemption*. These video game creators want to appear as if they're politically correct, yet despite this, they also realize that if they are going to make a western, they have to bend to a well-established genre rife with racial tropes deeply tied to mainstream audience expectations.

¹⁵ The "making strange tool" is a discourse analysis technique, by which the analyst examines data as if he/she were an outsider. In other words, the analyst looks at data as if he/she ". . . does not share the knowledge and assumptions and make the inferences . . ." that make communication fluid and are taken for granted by insiders (Gee, *How to do Discourse Analysis* 12).

The producers of old Hollywood westerns constructed these tropes during a time that many would consider to be of greater ignorance and racism than current times (regardless of whether it is true or not¹⁶). Today an outdated recreation of an Old West movie may not be looked upon favorably by a great deal of America's younger generations. These youth may quickly discern that the depictions of race in westerns are both ignorant and intentional expressions of their racist producers.

Being the cutting edge and globally distributed game house that Rockstar is, they want to provide us with a classical western production, complete with racism, but at the same time they want to communicate to us that they are not ignorant and racist like their predecessors, and that they are in fact also aware and perhaps even critical of racism in the media. They want to defy their dilemma by communicating to us that they aren't responsible because they didn't make this stuff up, and that their actions are subordinate to the figured world of the Wild West myth.

Rockstar Games is covertly motivated to make a production true to this myth because they believe that it still captures the American Imagination (they would have never hedged their investments on one of the most expensive video games to produce if they had felt otherwise). But again, they want to do this without the risk of being branded as racists themselves! Let's continue to look at the discourse above to see how Rockstar Games attempts to pull this off.

¹⁶ Look at Arizona, for example, this is a place with a famous and elected white cowboy named Sheriff Joe Arpaio who goes after his archenemies, the Mexican Indians, to save the day. Side note digression: Isn't it interesting how the surname Arpaio harkens back to old Hispania?!!!

In sections 1 and 3, the women who are conversing also use the deictic “they” in addition to the one already been presented above. They use this word in an interesting way. The word “they” is strategically placed to refer to Native Americans. The characters do not use ethnic labels to refer to Native Americans in cases where statements are designed to dehumanize them as “the other” or to illustrate that they are peoples who have lost something to colonization. The only time that Native Americans are referred to more explicitly with a label, in this case “the Natives,” is when they must be made more human in order to legitimize the Christian work of “civilizing” and “helping” them.

If Rockstar Games would have been more interested in being historically correct like many of the blogging gamers defend them to be, Mrs. Bush would have referred to them as “the Indians,” instead of what would appear to be a slightly more politically correct and contemporary expression, “. . . the Natives¹⁷.” This is a great example of the funky chicken dance that Rockstar games is trying to do in order to be politically correct while also producing a western that extends racist classic westerns.

One of the most interesting and telling aspects of the discourse above is the Characters’ exaggerated uses of intonation, the frequent exaggerated stressed emphasis of words, and the over exaggerated volume dynamics expressed by the characters throughout the game trailer. This remains consistent with other character scenes that occur throughout the game. When analyzing the words that are stressed in the characters’ speeches, we find that the majority of these expressions are content words or lexical

¹⁷ This is expression is not politically correct either, and to do anything different would undermine the character that Rockstar Games is constructing. However it is an expression that derives from the more politically correct label which is “Native Americans.”

words that make the connections between racism, religious beliefs, and politics extremely salient. The over exaggerated dynamic ways in which these lexical terms are expressed make it easy for the audience to recognize character stereotypes. For example, the two elderly genteel women are gossipers, while the preacher and the young women define each other, one as a spiritual leader, and the other a young impressionable follower.

The over exaggerated expressions of these characters render them as caricatures or cartoons of people. This is where it starts to become clear how Rockstar Games strategically distances themselves from the Wild West producers of yesteryear. They do this by constructing characters that are comical and not meant to be taken seriously by gamers. In other words, Rockstar Games has created a western that is meant to be tongue-in-cheek. To confirm this conclusion, it is time for us to refer back to context.

Looking at the portfolio of Rockstar Games productions, it becomes clear that this is a company that makes hundreds of millions of dollars by creating games that contain controversial and adult content (“Video Game Maker”). They are the creators of the high grossing *Grand Theft Auto* series of games notoriously known for their violence, sexual content, racism, and crime (1997 - 2009). Although these themes are presented in a satirical fashion, these video games remain highly controversial.

In addition to this game, Rockstar has also produced another controversial game titled *Bully* (2006 & 2008). This game, the player assumes the role of “Jimmy” Hopkins, who raises hell (although not without having to face the consequences of his actions) as a bully at Bullworth Academy. This is the game that confirms the conclusion that Rockstar’s strategy is to present controversy through the creation of tongue-in-check

games in an attempt to subvert the overt controversies encoded by their games. Here's our evidence. On the backside of the *Bully* video game disc case, Rockstar states the following about their video games (2006 & 2008): "*Bully takes the Rockstar tradition of groundbreaking and original gameplay and humorous tongue-in-cheek storytelling to an entirely new setting [...]*"

Now that I have presented and confirmed my discourse analysis regarding the presentation of "tongue-in-cheek" racism in *Red Dead Redemption*, let's turn our attention to the outcomes of Rockstar's strategy by asking the question: What is Rockstar doing with this? To answer this question I will start with the most obvious answer, which is that they are making profits in the order of tens of millions of dollars on video games sales ("Video Game Maker"). In addition to this, according to co-founder of Rockstar Games Dan Houser, they create the games they find interesting to make while also creating them to "fulfill peoples fantasies" ("Dan Houser Talks"). Houser portrays Rockstar as a company that creates games that critique American culture (Fritz).

However, I argue that a company cannot create a social critique while also fulfilling the fantasies of gamers who often want to enact questionable things in digital-land. It seems that the formula of Rockstar Games is to deliberately create controversy. I argue that this is a strategy that has them smiling all the way to the bank, because they know that the good and bad publicity of their products leads to strong sales. They are creating a brand. These guys are the winners, and so are the video gamers who enjoy playing these games. Now, since these productions are enjoyed by millions of gamers throughout the world, we must ask ourselves another question: What are the benefits and

costs to society? Asking this question may lead you to realize that *Red Dead Redemption* begins to look quite a bit like “*The Good, the Bad and the Ugly*.”

It doesn't matter if you are a person of color eviscerated by the experience of playing *Red Dead Redemption*; or a person who uses the video game as a way to dialogue about racism and social change; or a racist who gets satisfaction from the game's racial stereotypes and the ability to use a white avatar to kill virtual reality people of color; or if you are a gamer who sees the legendary myth of the game's Wild West as a non-fictional recreation of how it used to be; or if you are a gamer who loves the experience of playing the game so much that you loyally defend Rockstar Games; or if you are an underage gamer playing the game, its probably true that Rockstar Games loves, encourages, and embraces all of this because it all materializes into major profits for them. It's their business model, and a brand they are clearly proud of. This company is smart, and it uses tongue-in-cheek to get away with murder!

As a gamer, I personally find *Red Dead Redemption* to be one of my most favorite video games. Because of this, I must ask myself: What are the costs and benefits to society that emerge as I entertain myself with games like *Red Dead Redemption*? As a mestizo of Native American and Mexican heritage, I have a responsibility towards my community and the communities I care about. I have been brought up to focus beyond my individualism, and to think deeply about the wellbeing of my people and our related communities. As a member of my community it is my job to think ethically to identify the ways that corporate and government actions and their media mold social knowledge

and consciousness. Because of all this, I am compelled to look at how these artifacts work to construct the clearly inequitable world we inhabit.

If you look at gamer blogs that focus on the racism in *Red Dead Redemption*, you can begin to see that gamers don't appear to always discern the difference between the Hollywood constructed myth of the Wild West and the historical Wild West (Byrne; "Racism/anti-Semitism"; "Racist or Realistic??"). This is unfortunate because gamers imply that the figured world of *Red Dead Redemption* is part of Rockstar Games' intention to provide educational experiences about how it really was back then — odd, not because some of what is depicted in *Red Dead Redemption* might connect to historical evidence, but because Rockstar never claims to make education technology. Unfortunately, gamers don't always do their research, and they often fail to produce evidence to support their defensive claims. Houser himself talks about how Rockstar did their research in the following quote from USA Today (Snider):

we watched hundreds of westerns, read novels, watched great tv shows, went out into the desert, argued about some types of trees, visited the National archives in DC to get period photographs of people and buildings, read old versions of the sears catalogues. anything and everything to bring the time and place to life.

There is little doubt that many of these resources have some historical knowledge embedded in them, but notice how Houser cites only the media and physical place. It turns out he may not be telling us the truth when he states Rockstar did "anything and everything to bring the time and place to life (Snider)." You see, he never explicitly demonstrates that he consulted with historians, Native Americans, families who are descendants of some of the first colonists, descendants of the Chinese railroad builders, Mexicans, anthropologists, etc. When we look at his statement, it leaves the possibility

open that he did not even reference non-fictional books. Houser is clearly only interested in getting the aesthetic, half-ass semiotic, geological, and biological representation of place correct. The rest of the story is the Wild West myth shopped straight out of past popular media constructions.

So perhaps one of the costs to society is that we may now have thousands, if not millions, of privileged gamers who believe in a sense of history constructed from a video game made by producers that only did enough research to reconstruct a Hollywood western. This I argue leads to a false understanding about whom our American ancestors are, both settlers and indigenous peoples. This manifests itself in the form of dark consequences when bloggers use their assumptions regarding the historical authenticity of the game to silence those who might have been racially hurt by the game, or concerned about its societal repercussions.

The challenge for us gamers is to learn how to appropriate these games in ways that allow us to analyze them critically. To achieve this, we need to build the capacity to have constructive dialogues that inspire us to take responsibility for the history of our peoples, especially those histories that are currently subjugated. I believe this would be a great end state for a game, and a benefit to society. This makes more sense to me than us gamers paying multi-million dollar corporations to entertain us with racially biased myths. We no longer live in a world where there is plenty of space and vast resources beyond our imagination. We are living in a time where these things are rapidly being depleted, and this process is creating an uninhabitable world.

Since so many resources, such as money, time, labor, electricity, applied science, art, and our youth's time, are being invested into *Red Dead Redemption* by us both as producers and consumers, I would like to suggest that we think about how we can widen the frame of our play beyond entertainment. Unless we transform it into a constructive dialogue, *Red Dead Redemption* is maladapted to provide us with the knowledge we need to adjust to the reality that everyday our world is getting smaller via video games and other digital technologies.

I believe the potential exists for video games to be highly educational, and I think that for starters we need to build our capacity to think deeper about the games we play. We need to learn to listen to each other and value each other's ideas (including protocols for doing this; blogs are evidence of people constantly disrespecting each other), and we need to learn to think as groups in reflective non-essentialist ways. Dialogues require meaningful relationship building that entails patience, dedication, and hard work (Bohm).

There is a great focus on leveraging the power of video games for STEM (Science, Technology, Engineering, Math) learning, which I agree is a good idea. I would also like to extend STEM with the notion that dialogue is also a 21st century skill. Think about the challenges we face with diplomacy and systems complexity in today's world; our ability to succeed will depend on our ability to dialogue. I don't currently see it as a skill we humans are particularly very good at these days, both face-to-face and on the Internet. Video games are ripe for curricula that could be scaled to promote research, analysis, and dialogues by our youth, and across generations as well.

Clicking back on the productions by NASA, Mel Gibson, and James Cameron, this essay illustrates how colonial narratives driven by colonial society's religious fervor, as described by Bercovitch's *American Jeremiad*, continue to dominate mass media tropes in popular culture. In this essay, I have also demonstrated how today's hyperrealism usurps history, justice, and indigenous self-determined representations of self. The intention of this essay is not to focus on the power of the medium per se, but to examine the colonial media that are produced and distributed using what are, in the cases presented in this essay, colonial mediums leveraged to justify colonization.

As discussed earlier, the examples of media presented in this essay are not exceptional, but are productions stemming from a long colonial tradition of media. Although only a few examples are presented in this essay, they provide powerful and compelling evidence of colonization. These examples and the analyses provided indicate that it is essential for indigenous peoples to gain control over the media in order to operationalize their sovereignty, while also protecting themselves from the colonizing forces of popular media. However, indigenous control of the media is not enough if indigenous peoples engage in the hegemonic production of colonial stereotypes for economic prosperity. In other words it does us no good if we use our control to perpetuate stereotypes for the racist gaze.

Although the examples and analyses provide a compelling discourse for why it is important for indigenous peoples to assert their own control over media, there is much more than just the control of media at stake when it comes to indigenous sovereignty. This is because it isn't only the disconcerting manifestations of colonizing media such as

Apocalypto, *Avatar*, and *Red Dead Redemption* that pose challenges for indigenous sovereignty. In addition to messages are the tools or mediums embedded with colonial values and non-indigenous assumptions/perspectives that are used to create and distribute such content. These values were described earlier in this essay, and include technological neutrality, technological determinism, technocracy, techtopianism, etc.

In the case of mediums, not only is it important to recognize that technologies, in the context of colonial message-making, are encoded with colonial values, but even more concerning lies a theory to support the possibility that the tools themselves encode colonial values and thus have an even greater colonial impact than the content they are used to produce and distribute/broadcast (McLuhan and Fiore 8-9). Regardless of the degree by which this theory predicts our reality, indigenous peoples must also gain control over electronic production and distribution mediums like digital technologies.

Today, controlling both mediums and media is essential for indigenous sovereignty, which includes the ability to navigate an age of advancing ubiquitous information, speed, and hyperrealism on indigenous terms. There is an urgency associated with building the indigenous critical capacities necessary to control mediums and media. This urgency is associated to the exponential advancement of these already powerful technologies that influence our behaviors and define our everyday lived realities (Lessig, *Code and Other Laws* 198-199, 205-207).

Essay 3.2 – Toward a Vision of Tecno-Sovereignty

Prologue

Technologies augment the human ability to manipulate facets of an environment; this includes places like virtual, physical, and spiritual worlds. These tools are used within societies to modify objects, create artifacts, mediate relationships, and facilitate culture. Their designs are infused with the social, political, rhetorical, cultural, aesthetic, and economic motives and values of a society. On their own, tools, which embody a value infused materiality, have societal consequences, and as extensions of persons, these consequences potentially become infinitely complicated. In this article, I propose a media theory based on indigenous knowledge(s) as a framework for the development and use of electronic technology¹⁸ by indigenous peoples. The purpose of this framework is to promote a dialogue regarding the potential convergence of electronic technologies and traditional indigenous media to generate new tools for indigenous¹⁹ self-determination and sovereignty,²⁰ which is an idea I refer to as Tecno-Sovereignty or Indigenous

¹⁸ In this article, “electronic technology” refers to electric powered analog and digital technology. Examples of these include, electronic media, radio, television, video games, computers, circuits, computer languages, software, Internet, smart phones, electric appliances, human computer interfaces, etc.

¹⁹ In this paper, I use the word indigenous to refer to diverse populations around the world who maintain they descend from the earliest inhabitants of their local geographies, as often told in their creation stories. I also use the word indigenous to describe peoples who are connected to the ecologies of their lands through emergent local knowledge systems and practices that have been passed down from generation to generation for thousands of years. Examples of indigenous peoples include hundreds of diverse cultures within North America identified as Native Americans, First Nations Peoples, Alaska Natives, los grupos indígenas de México, and Indigenous Mestizos. It is not my intention to use the term indigenous in this paper as a means to reify peoples as a singular group of people, but to highlight a large diversity of aboriginal peoples who are destabilized by colonization and globalization in whatever forms these forces take.

²⁰ Within the contexts of imperialism, colonization and globalization, indigenous concepts of self-determination and sovereignty drive indigenous theories and practices of law, culture, politics, food production, land stewardship, technology, and economy. Indigenous self-determination and sovereignty are two distinct concepts, yet they are highly interrelated. For the purposes of this article, I define indigenous self-determination as the action and practices of groups to design and maintain government, economy,

Technological Sovereignty. To provide a context for Tecno-Sovereignty, in this article I also present a critique of marketplace and militarized electronic technologies, implicating them as instruments for colonization and globalization.

A perspective that radiates from a place in Northern New Mexico

I was initially inspired to think about the role of electronic technology as a site for indigenous self-determination while taking indigenous knowledge systems graduate studies courses by Professor Bryan Brayboy, as well as media theory graduate courses at Arizona State University. During this time, I came across an article titled “Constituents of a Theory of the Media.” In this article, the German poet Hans Mangus Enzensberger proposes that a natural property of the media is its ability to be egalitarian (265).

Enzensberger believes that when receivers also have the ability to act as producers or manipulators of media, information can no longer be controlled or contained. He goes on to posit that the capacity to produce and distribute media provides people with the ability to assume control and preserve history free of censorship (263-265). Media theorist Henry Jenkins extends Enzensberger’s theory by stating that the ability for people to

education, identity, and culture as they deem necessary and appropriate in whatever fashion they determine for themselves. By indigenous sovereignty, I am referring to the inherent rights of indigenous governments such as Native American Nations to facilitate their own systems of governance without interference from any outside governing body. Scholar Bryan Brayboy, in his course on indigenous knowledge systems and education clearly defines the relationship between indigenous self-determination and sovereignty. Brayboy argues that the role of self-determination is to operationalize indigenous sovereignty. Indigenous self-determination and sovereignty also include indigenous peoples rights to their respective homelands and the resources geographically associated to them. In the article titled *Sovereignty*, indigenous scholar Taiaiake Alfred (Mohawk) examines the notion of Sovereignty (originally a European concept) where he states that it may not be the best approach to indigenous self-determination. However, he clarifies that despite this, many positive outcomes have emerged as a result of indigenous peoples exercising sovereignty. He asserts that this has occurred because “Native sovereignty” as he refers to it, “. . . —is founded on an ideology of indigenous nationalism and a rejection of the models of government rooted in European values (“Sovereignty” 40).” The conceptual framework of sovereignty presented herein is consistent with Alfred’s idea of “Native sovereignty.”

produce electronic media, through citizen participation, at the nexus of older and emerging media platforms, can potentially lead to a world of collective intelligences wherein media is decentered from the old regimes of power (Jenkins 1-24, 25-58, 251-270). According to Enzensberger, a community using a system of technology allowing public participation in the exchange of media has the potential to decentralize undemocratic, depoliticizing, colonizing, and monopolizing power (259-275). In fact, Jenkins and his colleague Deuze observe that public participation in the production, distribution, and reception of media has created a new transitional climate where: “Everything seems up for grabs with power, wealth, knowledge, and influence redispersed with each shift of the media landscape. (7)”

After having thought about the work of Enzensberger and Jenkins, I began to examine their ideas in relation to the discourse of indigenous scholars such as Vine Deloria Jr., Taiaiake Alfred, and Scott Richard Lyons. All three of these scholars propose ideas for indigenous sovereignty and self-determination: while Deloria lays a scholarly foundation to define indigenous sovereignty; Taiaiake explicitly calls for the indigenous control of media as a key element of Native sovereignty; and Lyons proposes literacy (reading and writing) as a tool for the exercise of indigenous sovereignty (Alfred, *Wasáse* 207-208; Deloria Jr., *We Talk*; Lyons, “Rhetorical Sovereignty”). After reflecting upon the work of these scholars, as well as evidence of indigenous media, I propose that indigenous peoples must apply their concepts of sovereignty and self-determination to practices of electronic technology in order to take advantage of the potential for media to

support the needs and desires of their respective communities. To unpack this proposal, I will start by providing some context through my own personal narrative:

I am Alcaldeño, a Mestizo from Northern New Mexico. I was born in Santa Fe, New Mexico, and raised in el Pueblo de Alcalde, which is a small village located along the interstate highway between Santa Fe and Taos. Alcalde is one of the many pueblo communities located within the Española Valley. Some of these pueblos are part of the Eight Northern Indian pueblos. Examples of Native American pueblos are Santa Clara Pueblo and Ohkay Owingeh, while Mestizos and indo-Hispanics²¹ inhabit neighboring pueblos, such as Alcalde and Chimayo. I come from a close-knit community of a little under 400 people, which is of similar size to many of the villages situated within the Upper Rio Grande Valley.

Throughout the centuries following the historic Pueblo Revolt of 1680, all the pueblos of this region began the creation of intercommunity networks which remain emergent today. Agrarian practices and indigenous food remain a cultural source of pride for all the communities of Northern New Mexico. This is due to the influence of Native American Pueblo peoples of this region and Mexican indigenous peoples, all of whom have maintained agrarian societies since time immemorial. Over the past several decades these Upper Rio Grande Valley agrarian communities have been sharply impacted by the normalization of capitalism, materialism, and limited employment opportunities. These factors have led members of all the upper Rio Grande pueblo communities to build economic dependencies on Los Alamos and Sandia National Laboratories. Throughout

²¹ Indo-Hispanic is a term used to describe people of Spanish descent whose ancestors settled in Northern New Mexico during Spanish colonization.

the Cold War and the current post-industrial era, these places of employment continue to remain some of the only economically viable sources of income in this region. As a result, our agriculture has become the people's supporting method of subsistence as opposed to its primary method, and the social, health, and environmental impacts of this have been devastating to our communities (Montiel, Atencio, and Mares 9-13).

The national laboratories of this region function as technology stewards of the U.S. nuclear stockpile. The responsibility of these laboratories includes the development and maintenance of the U.S. nuclear arsenal. As these science and technology laboratories advanced beyond the Manhattan Project and into the Cold War, they brought a level of unprecedented monetary prosperity to the people of the Upper Rio Grande Valley. With this prosperity, the development and manufacturing of weapons of mass destruction also brought with it generations who have suffered and currently suffer from cancer and other chronic illnesses associated with exposure to radioactive and other hazardous materials. The lands of this region have also been polluted by environmental exposure to these materials, and the hearts of many indigenous men and women have been hardened by their involvement in the construction of weapons of mass destruction. As if this wasn't enough, the people's psycho-spiritual wellbeing has been further compromised at the hands of one of the world's largest cohort of nuclear physicists complicit for having created an environment where some of the most overt displays of

racism²² have been directed at people of color in this region since Spanish colonization pre-dating the Pueblo Revolt²³.

Because of limited employment opportunities, many young people (although not the majority) have found themselves in the position of having to leave the Upper Rio Grande Valley to seek education and employment opportunities elsewhere. However, much like me, many return throughout the year to participate in community events such as ceremonies and feast days. We return to heal, remain connected with members of our communities, provide care for our families, pray, and pay our respects to the land and our ancestors. The land, and the food it offers us, is revered across America, and our families remain the stewards of seeds that have been in our care for generations. Similar to many indigenous societies around the world, these ways of being and practices demonstrate that, for us, the heart of our communities is centered on our struggles to maintain our strength through connections, relationships, and responsibilities toward each other, and a deep respect for the places we call home.

²² These displays of racism also include environmental racism, which is described in the environmental encyclopedia titled *Pollution A-Z* as: “. . . used to describe racial disparities in a range of actions and processes, including but not limited to the (1) increased likelihood of being exposed to environmental hazards; (2) disproportionate negative impacts of environmental processes; (3) disproportionate negative impacts of environmental policies, for example, the differential rate of cleanup of environmental contaminants in communities composed of different racial groups; (4) deliberate targeting and siting of noxious facilities in particular communities; (5) environmental blackmail that arises when workers are coerced or forced to choose between hazardous jobs and environmental standards; (6) segregation of ethnic minority workers in dangerous and dirty jobs; (7) lack of access to or inadequate maintenance of environmental amenities such as parks and playgrounds; and (8) inequality in environmental services such as garbage removal and transportation (p.209, 2006).”

²³ This statement is not meant to imply that Spanish colonial racism ceased to exist after the Pueblo Revolt, however, following the revolt there has been progress in building cross-community coalitions, co-intentional cultural syncretism, and interpersonal relationships between friends and families. The indigenous Mexican populations that came with the Spanish to this region also enriched this diversity, as did the Mestizos. Syncretism from this history continues to emerge today.

As a Mestizo from Northern New Mexico, my Pueblo *Xicano*²⁴ roots compel me to pursue my academic and community vocation as a “tecno-cultural worker.” I define “tecno-cultural worker” as someone who contributes to the self-determination of one’s community through regional intra-community and national/international cross-cultural collaborations yielding indigenous expressions of meaningful and useful art and technology. A tecno-cultural worker expresses art and technology designs as part of co-intentional collaborations based on reciprocity and the intention to contribute to the self-determination of given indigenous communities in which they work. I have chosen this vocation not out of a fetish for technology, but out of a concern for the ways which these technologies impact indigenous communities. This is influenced by my experiences having witnessed the negative effects that applied knowledge practices at National Laboratories, such as the one at Los Alamos, have on people and the environment.

To communicate my concerns about the colonial impacts of technology to indigenous communities, I collaborate within interdisciplinary cross-cultural partnerships between Chicana/o, Native American, and academic communities for the development of indigenous forms of artistic mediums and media. Examples of this include new media technologies that I often co-intentionally build and position with my collaborators as

²⁴ I evoke the word Xicano (Chicano) to refer to my identity as a Northern New Mexican Mestizo. As a part of my cultural heritage, I use it to politically symbolize my solidarity with indigenous peoples throughout the world. I refer to myself as Xicano to remember my ancestor’s aspirations for the U.S. federal government to honor their land rights through the Treaty of Guadalupe Hidalgo. As an act of self-determination, I stand with my indigenous brothers and sisters on our ancestral spiritual homelands to defend our human rights to have our local histories, cultures (worldviews), and languages recognized, respected, and included within formal education.

tools for *indigenous “re-imagined” ceremonies*,²⁵ which are primarily designed for learning. In this work we construct our own electronic technology designed to promote the learning of cultural practices such as oral literacy. This includes reflective listening, oratory practices, story-work²⁶, and community dialogues based on respect for cultural protocols and accountability to our communities.

²⁵ Indigenous re-imagined ceremony is a concept by which new indigenous ceremonial practices are created to respond to a need, issue, or challenge. The role of these practices is not to replace, modify, or critique traditional ceremony. Traditional ceremonies are established as sacred rituals crucial to the ongoing survival and excellence of indigenous peoples, and they are the core practices that define indigenous communities. The purpose of indigenous re-imagined ceremony is to extend the spirit of traditional ritual and ceremonial practices in ways that respond to challenges like electronic media, which may or may not be outside the scope of traditional ceremony. In other words, re-imagined ceremonies are created in the spirit of traditional indigenous ceremonies. Within indigenous re-imagined ceremony, new implements are positioned into an indigenous worldview, whether they are originally inspired within a community or appropriated. Examples of a re-imagined ceremony include literature written by Native American scholars, poets, and storytellers, who have approached literacy (reading and writing) with uses of language that are culturally relevant, purposeful, useful, and meaningful to indigenous people. These uses include innovations of non-linear narrative structures, expressions of humor, a sense of oral storytelling, character development, rhythm, metaphor, and embedded theory unique to given place-based indigenous experiences and worldviews. Through the re-imagined ceremony of literature, indigenous knowledge is generated and acquired. This is not unlike the role of traditional indigenous ceremonies to teach and create. Shawn Wilson, author of the book titled *Research is Ceremony*, also explores the idea of re-imagined ceremony in his work (Wilson, 2008). Wilson, an indigenous scholar, writes about the idea of (re)positioning academic research, a colonial construct, in a manner that (re)forms it into a uniquely indigenous methodology. He argues this is possible by framing research within the context of indigenous notions of relationships. This is opposed to the western paradigm of dissecting and categorizing ideas in ways that render them disparate from each other. Another brief example of indigenous re-imagined ceremony can be found within the world of conceptual art. Within this domain, the indigenous artist collective *POSTCOMMODITY* appropriates the aesthetic vocabulary of western formal aesthetics and connects it to Native American aesthetics in order to create new indigenous works of re-imagined ceremony demonstrating indigenous metaphors that proliferate colonial institutions with an indigenous worldview (Postcommodity, 2012). These are but only a few examples of indigenous re-imagined ceremony and are evidence that demonstrate a precedence of re-imagined ceremony for raising public consciousness during this age of ongoing colonization. Today, traditional and re-imagined ceremony communicate that Indigenous peoples and their respective cultures remain emergent.

²⁶ In this statement I use the term story-work to mean storytelling through expressions such as music, dance, gestures, words, images, etc.

To clarify the disciplinary roots of these practices that lie outside of my experiential knowledge as a Mestizo, I am an intermedia artist and a digital literacy²⁷ researcher. As an artist and researcher I focus on the topics of indigenous media and self-determination. The disciplines of art and academic research are sometimes perceived as discrete from each other, however in my work I have developed practices that intentionally draw a continuum between these disciplines and their respective institutions. My process includes the development of rhetorical and theoretical work put into community practice through artistic and technological expressions.

As an artist and researcher, I have a different orientation to media than my colleagues in the academy and the art world. In both arts and research I often collaborate with digital-literate communities of people engaged in the study and development of interactive electronic technologies. In comparison to my collaborators, I limit both the number and use of electronic applications in my daily life. Examples of applications I don't use include social media tools such as Facebook and Twitter. My choice to abstain from certain types of technology has to do with the traditional Northern New Mexican ethics I was raised to embody. I come from a valley of networked communities of people who value gathering together in shared physical spaces as the most sacred and sensible way to communicate. Despite this, it is important to make the distinction that younger generations of Northern New Mexicans have a less cautious approach to social media,

²⁷ Digital literacy is the decoding, comprehension, creation, control, and broadcasting (distribution) of messages encoded in images, moving images, text, sound, and other forms of feedback and interactivity via electronic digital media.

and that they are living in a world that is different from the one I grew up in. The realities they face differ from when I was their age²⁸.

As a child, all members of my community raised me to understand and practice the ethics and values tied to the knowledge systems of my culture. I acquired cultural theories and practices growing up in a time when the personal computer was first being invented and not yet transferred to society. During this time I learned that the forms of communication requiring the most accountability happen between people who share physical space, and a common understanding of place. This particular belief is deeply connected to the high desert agrarian societies of the upper Rio Grande Valley, and a significant history of people working together to sustain their lives and communities. Accountability and diplomacy are requisite practices in order for local civilizations to share water in a desert environment in ways that are sustainable and equitable.

Living within the natural ecology of the Upper Rio Grande Valley results from accountability to community on the part of its members. Sharing water in a desert is not idyllic, and remains an ongoing challenge that includes conflicts between individuals and communities. However, having grown up in a community that requires a high level of responsibility on the part of its members to each other, I assume that the communication occurring via online social media is lacking the deeper kinds of relationships that emerge

²⁸ As a male entering middle age, I would argue that the youth in my community are assaulted by a marketplace culture that promotes the norms and values of popular culture. I admit that this is not all that different than my own experiences growing up. However, what has changed is that popular culture and markets are now almost entirely mediated through a highly evolved network of pervasive interactive electronic media. This media is much more powerful than anything I ever experienced growing up. The meaning of the word “powerful” is complex in almost every context I can imagine, and it is no less different in the context of electronic media. One powerful aspect of today’s electronic media is its ability to be extremely seductive, persuasive, and thus influential for youth and adults alike. Often times this is regardless of one’s primary cultural norms and values.

between cooperative members of a bioregional community who have to cooperatively share water. I understand that my assumption about social media is open to debate. However, because of my perspective and values, I am inclined to limit my use of popular social media technologies while investing my time developing electronic technologies that respond to cultural models for the types of communication I grew up with.

In today's digital age, peoples are often not informed of the individual and cultural implications, both positive and negative, that electronic technology has on their communities and lived experiences. Many indigenous peoples do not have the electronic literacy skills necessary to make choices that consider the deep implications of electronic technology. Perhaps one way to address this problem is by building local indigenous learning environments that promote the acquisition of digital literacy and critical media literacy skills. These learning environments can be defined by curricula including local community knowledge and ideas about technology (Kafai et al. "Ethnocomputing"). Electronic literacy projects contextualized by indigenous knowledge may increase an indigenous capacity to address the radical technological changes that many communities are experiencing due to pervasive electronic technology.

Examples of change mediated by electronic technology can be found in New Mexican pueblo communities, both Native American and Mestizo. These communities are currently undergoing drastic transformations accelerated by U.S. post-industrialism and globalization, both of which are driven by electronic technology now transferred to all Northern New Mexican communities. Through this technology, persuasive electronic media is primarily communicated to promote the normalization of capitalism,

materialism, and individualism. Over the course of time, this trinity of ideas has resulted in: (1.) the “*Disneyfication*”²⁹ of Native American and Chicano culture(s) where indigenous peoples of New Mexico have little choice but to engage in cultural production to meet the expectations of the tourist gaze (Alfred, Wasáse 43); (2.) a trade skill labor force at national scientific laboratories where Mestizo and Native American peoples are exposed to hazardous materials while implicated in the development of nuclear weapons; and (3.) the proliferation of pervasive forms of technology such as smart-phones and internet, both of which bear the thumbprints of a global capitalistic worldview. These technologies and their associated media are changing the cultural consciousness (this includes: our truths, ethics, aesthetics, ways of being, ways of learning, and ways of believing (our metaphysical role) in relation to land and each other) of the Native American and Mestizo people of this area (Brayboy, “Indigenous Knowledge Systems”).

The changes enumerated above are implicated in the destabilization of traditional communication methods that have maintained the health of communities in the Northern New Mexican region for thousands of years. The people’s growing separation from traditional ways of being have led to dramatic increases in social and health problems that

²⁹ By *Disneyfication*, I am referring to simulations of an imagined past and present where Native American and Chicana/o identities and cultures are constructed into stereotypes and rendered as artifacts to create mass produced commodities by market-based colonizing forces (this is not unlike the way Disney constructs notions of indigenous cultures for its corporate entertainment media) (Purdy 100-118). For example, this “*Disneyfied*” system of signifiers is packaged to create a Northern New Mexican cultural theme park where tourists flock to places such as Santa Fe in search of the “*tri-cultural New Mexican experience*.” This has led to the gentrification and destruction of indigenous pueblos and plazas like Santa Fe and Taos. This gentrification has claimed the life of indigenous places. This includes the co-opting of indigenous food, stories, aesthetics, art, architecture, agricultural knowledge, etc. which have all been refashioned in the image of American whiteness. This has also evolved into a cultural hegemony that seeks to silence the voices of the indigenous peoples of Northern New Mexico, as well as control their histories and culture for monetary gains, which includes the control of land and labor.

currently plague all Northern New Mexican communities. Admittedly, these problems are complex and the reasons for their existence cannot be reduced solely to the three catalysts enumerated in the previous paragraph. However, these contributing agents of social and cultural transformation raise indigenous elders' concerns and suspicions about the prepackaged "benefits" of electronic technology. Granted, many indigenous people do not lack vision regarding the potential uses and benefits of electronic technology. However many (including myself) maintain concerns regarding the centralized power(s) that control its development and that regulate and justify its legal use(s).

Concerns about the effects and impact of electronic technology on indigenous, under-resourced, minoritized, and/or marginalized communities are the reasons why the theory and development of electronic media construction has become the single most important activity of my everyday lived experience. Taking deliberate and active steps to address the growing concerns about the role and impact of electronic technology in indigenous communities has become increasingly important. As the rate of electronic technological innovation and transfer advances, expanding the legal and ethical concerns facing our communities, I become more concerned about the implications popular electronic technologies have regarding the sustainability of indigenous knowledge systems and practices. Living in a world governed via electronic media, I seek to address my concerns by engaging the rigorous practice of electronic technology. I do this with the specific intent of honoring the goal(s) of indigenous sovereignty and self-determination for the communities I work with/for.

Today it appears that, without a doubt, digital media and technology are here to stay. Like print media, they play an important role in today's society and are one of the largest sources of influence for today's youth. This raises significant implications for our successive generations. Digital literacies learned and acquired through the frequent usage of the Internet and multi-media devices such as video games, digital cameras, computers/laptops/tablets, smart phones, and media players like iPods have made it possible for youth (and adults) to incorporate electronic technology into their dominant daily social practices. As countless elders have lamented, many of our youth today possess more knowledge about electronic media than they do of their ancestral knowledges, practices, and languages. However, it remains possible that if youth were to acquire knowledge of their cultural traditions and practices, they might become motivated to do so via electronic mediums such as by using iPads or video games. In other words, the cultural (dis)connections within our youth become problematic **only** if we are unable to assert ourselves critically, politically, and economically as diverse culturally distinct peoples within the technological domain — both electronic and non-electronic, but with special attention to electronic media and its increasing velocities.

By suggesting the use of electronic technology as a tool for learning, I am not suggesting that our only hope to teach our youth is through electronics, but I am suggesting that it is important that we learn to position these technologies so that, for example, they encourage oral inter-generational communication and collaboration to take place in co-located space. By this I am referring to verbal and gestural communication, and not, for example, to people in the same room texting each other. (Re)claiming the

intent and production practices of technological implements, mediums, and innovations opens up ample opportunity for indigenous peoples to leverage the power of electronic media to sustain and repatriate local cultural knowledge and practices.

During a time that many indigenous peoples around the world fight to maintain or breathe life anew into their languages, it remains imperative to the exercise of self-determination that we take the future of electronic technology into our own hands with all due haste. I concede it is possible for indigenous peoples to approach both the development and use of electronic technology through a synthesis of indigenous knowledge and the consideration of western knowledge in areas where such knowledge is complimentary to indigenous self-determination. In such cases, an indigenous-led dialogue that includes a diversity of knowledges can be useful for the development of new indigenous theories of media with the intention of creating positive outcomes in education, health, ecology, and the continuance of communities such as my own in Northern New Mexico. Such theories may provide indigenous communities with guiding principles for the innovation and use of electronic technologies based upon their unique ways of being, and not those of the colonizer.

I. Contrasting Approaches to Technology

Throughout the Western Hemisphere, contemporary innovation has become synonymous with the Western-scientific worldview. This perception has emerged as the status quo of the Americas, and in other geopolitical spaces throughout the world. In these spaces, often left unaddressed in societal, academic, and political discussions is the observation that the world's technological heritage emerges from *both* western

knowledge and indigenous world knowledge(s). This lack of acknowledgment ties to colonial and imperial ideologies that marginalize indigenous knowledge systems, or privilege western knowledge over indigenous knowledge (Barnhardt and Kawagley 10; Brayboy, “Tribal Critical Race Theory” 425-446; Castagno and Brayboy 739-740; McCarty and Lee 104-105). These same forces seeking the assimilation and erasure of indigenous peoples have also co-opted indigenous knowledge and innovations. Indeed, marginalizing peoples by patenting their ideas while taking their resources is a powerful method of colonization (Cajete, *Native Science* 8-9; Harry and Kanehe, 27-35).

Contrary to the colonial and imperial ideologies used to create labels about “others,” many indigenous peoples have demonstrated strong achievements with respect to *place-based*³⁰ practices of science, technology, arts, ethics, metaphysics, government, connected knowledge, and additional practices. Because indigenous peoples are decedents of ancestors who have in many cases continuously inhabited a given biome for thousands of years, they have had time to accumulate a large wealth of local knowledge through their successes and failures. Advancing beyond the lens of colonization, indigenous technology and other cultural practices are not any less “modern,” “contemporary,” or “relevant” than any other technology or cultural practices in use today. Many indigenous technologies derive from, what Brayboy in his course lectures describes as, dynamic “indigenous knowledge systems,” which are currently used in functional and meaningful ways to respond to contemporary changes. Indigenous

³⁰ Place-Based refers to a specific locality defined by a specific geography. A sense of place is created by the unique cultural connections that peoples have to the biomes that help define the geographies they inhabit.

technology derives through a patient process, and it often adapts to change as needed for the survival of a group.

Although *both* indigenous and Western practices have contributed toward the development of today's technology, it is clear that important cultural distinctions remain between the motives for why technology is created. In addition to these motives, there are also important cultural distinctions between the intended uses and benefits of technology. For example, technologies like the personal computer are often created to support concepts of the individual. Implicit in its design is its function to provide the individual with computational power via a single person interface by which the individual can interact with the digital world on her/his own terms, often (but not always) requiring that an individual only need be accountable to her/his personal needs and desires. Designs for this use are called upon through colonization, which asserts that indigenous peoples should adapt to these technologies.

Western technologies are often designed with the intention to engineer society, or construct notions of an ideal civilization (a utopia) affording individual leisure and privilege (Kozinets, 869). Through this ideological framework, Western societies are motivated to perform their technologies to secure and centralize military, financial, political, social and cultural power, as well as the world's natural resources. These global market-place activities often lead to unbalanced distributions of wealth or the formation of multi-national oligarchies: contributing to economic disparities, large-scale warfare, borders, and ecological disasters throughout the world. Within this context, Western

inspired technology continues to “improve”; however, it is not fundamentally evident that this has led to the overall wellbeing of humanity.³¹

Arguably there have been powerful Western advances that have improved the lives of people who are members of some populations. But these privileged populations are but a small minority of Earth’s overall population. For example, according to the World Bank there are currently an estimated 7 billion people living in the world today, with only about 3 billion users of the Internet worldwide according to Internet World Stats (“Internet Users in the World”). The desires of these populations along with their design and use of technology come at devastating costs to the health of our environment, and to the majority of the world’s indigenous populations who are left with little recourse but to confront the changes thrust upon them by the colonial, imperial neo-liberal, and capitalistic transfer of manufactured electronic technology.

In contrast to the imperial pervasive outcomes of Western technology, which are often built upon Cartesian-based philosophies, indigenous systems thinking epistemologies drive innovations that are designed to create and maintain *place-based* sustainable relationships between peoples and the local natural ecologies they inhabit (Barnhardt and Kawagley 19; Battiste 13; Brayboy and Maughan 10, Kawagley 11-18, Cajete, *Native Science*). This does not mean that technologies by indigenous peoples are

³¹ This is not to imply that it is impossible for humanity to advance its wellbeing through the use of Western technologies, or that instances of this do not occur in the world. However it is not clear this has significantly happened throughout Western modernity given the ways these tools are designed, created, positioned, and used. For example, electronic technology has not improved our ability to avert war without the need for deterrents such as weapons of mass destruction, which paradoxically are a frightening threat to humanity. Technology has not fundamentally helped us improve our ability to be diplomatic, nor has the power of these tools been used to develop equitable societies that can eliminate basic problems like hunger. It has however been most effectively leveraged for warfare, resource extraction, capitalism, imperialism and colonial exploration.

not without environmental consequences or that indigenous peoples have not created innovations with large ecological consequences, but that there are traditions of being and knowing that are in place to mitigate negative environmental impacts to the largest degree possible.

Indigenous technologies are used as a means to bring these ecologies into balance (or into a sustainable relationship) through processes based on principles such as relationships and reciprocity. As part of this balance, knowledge and technology are often positioned by indigenous peoples to support equitable distributions of resources and power, the needs of the group, social gatherings in physical space, local and distributed economies of scale, connectedness to land and accountability towards the health of its biomes, and interpersonal relationships based on respect and accountability. This approach is not perfect and remains challenging, but is foundational to the lived experiences of many indigenous peoples today.

Reflecting upon indigenous cultural approaches to technology provides a challenging context for indigenous peoples to think about the emergence of sovereignty and self-determination in a digital age. In this age, the Western influenced innovation and distribution of electronic technologies has led to an expanding global revolution. I am referring to an expansion caused by the accelerating market-driven transfer of electronic technology, and the ability of today's high-speed electronic technologies to mediate a highly commercialized and militarized world wide web (Internet/Panopticon) with increasing velocities and precision (Foucault; "NSA Collecting Phone Records;" Virilio, *Speed and Politics*; Virilio, *War and Cinema*). These technologies in their original and

intended states, for example, are the outcomes of Western design motives and assumptions that are not in a dialogue with many indigenous ways of being. Because of their global ubiquity, indigenous peoples must ask: How do we align our designs and uses of these high-speed electronic technologies in accordance with our values?

Today, the pervasiveness, functionality, velocities, and interfaces of networked electronic technologies are impacting all dimensions of society and cultures around the globe. Furthermore, regardless of their implications, all signs lead to a future where these technologies will continue to advance as well as proliferate indigenous societies. Because of this, it is especially timely for indigenous peoples to generate their own theories of electronic media and technology that reflect their respective *worldviews*³². For this reason I present one such theory within this essay. By integrating concepts like indigenous sovereignty, self-determination, and worldview into the ways we think about pervasive electronic technologies, we can create a larger space for indigenous peoples to influence the creation and innovation of these fields in ways that are place-based (or geo-political) and responsive to diverse indigenous ways of knowing and being.

Drawing primarily from the work of diverse North American indigenous³³ scholars and indigenous cultural practitioners whose scholarship and practices span the

³² Alfonso Ortiz (Tewa) from Ohkay Owingeh is quoted by Peggy V. Beck and Anna Lee Walters in their book *The Sacred: Ways of Knowledge, Sources of Life* as defining an indigenous notion of worldview as “. . . a distinctive vision of reality which not only interprets and orders the places and events in the experience of people, but lends form, direction, and continuity to life as well. World view provides people with a distinctive set of values, an identity, a feeling of rootedness, of belonging to a time and place, and a felt sense of continuity with a tradition that transcends the experience of a single lifetime, a tradition which may be said to even transcend time (1992, p. 6).”

³³ Many of these indigenous scholars identify as Native American/American Indian, Alaska Native, and/or Chicana/o (Many of who have descended from Native American and (or) indigenous Latin American ancestry).

field(s) of law, education, cultural studies, art, media, technology, storytelling, and indigenous knowledge systems, I argue that an indigenous led effort to critique Western media theories with extended efforts to bring these critical perspectives into a dialogue with indigenous knowledge can lead towards the innovation of electronic technologies that promote indigenous worldviews. By this I am referring to the creation of sustainable indigenous electronic technologies designed to promote, create, and regulate indigenous forms of education, law, medicine, and aesthetics³⁴. Through innovations and creative uses of electronic media, indigenous peoples can work toward a vision of technological sovereignty, or *Tecno-Sovereignty*. Grounded by indigenous ways of being and the exercise of self-determination, Tecno-Sovereignty is the indigenous creation and positioning of electronic technology by collaborative indigenous-led cohorts to meet all possible needs and interests of their respective communities.

Admittedly the ideas contained herein derive from a multitude of sources that have raised concerns about the way “tradition” and “media” have been defined and understood, both historically and contemporarily, within academic and non-academic environments. For indigenous thinkers, the implementation of the following theoretical framework may evoke concerns related to concepts of tradition. At the same time, the following theory may be problematic for non-indigenous thinkers because it (re)presents a shift in cultural values concerning electronic media. Although, in this essay, I will not delve too deeply into these debates, it is important to note that the following framework is

³⁴ Indigenous scholar Scott Richard Lyons makes this argument with respect to indigenous uses of reading and writing. He refers to this as Rhetorical Sovereignty, which is the indigenous use of reading and writing to control law, pedagogy, and aesthetics.

informed not only by extant literature and these debates, but also from a *Discourse*³⁵ influenced by my cultural experiences and knowledge. This influence includes the indigenous thinkers and media arts practitioners that I collaborate with to develop working examples of indigenous media.

As an indigenous inter-media artist and interactive media designer who intentionally participates in cross-cultural collaborations with Native American and Chicano artists and scholars, I acknowledge the existence of the great diversity of indigenous knowledge systems maintained amongst the thousands of indigenous communities around the world. Therefore, I am not offering a theory of universality, but one that exists to inform and/or inspire new theories. By offering a *governable* theory, it is my hope that the ideas in this essay will be framed, critiqued, revised, expanded, and adapted according to the vision that best responds to the locality and epistemology of any given indigenous community. Though the following theory is generated to inform positive outcomes, my optimism is not blind: I am aware that the nature of electronic media systems is young, chaotic, and originates from Western applied scientific traditions. For these reasons, I invite all indigenous communities to scrutinize these ideas with skepticism, while also remaining open to their earnest appeal.

II. Toward a Vision of Tecno-Sovereignty

Trends in new capitalism suggest that corporations around the world are increasingly networked through an evolving global economy responsible for creating

³⁵ Social Linguist James Paul Gee describes “. . . Discourses with a capital ‘D’” as “. . . not just language, and surely not just grammar, but saying (writing)–doing–being–valuing–believing combinations” (Gee, J.P., 2011, p. 151).

larger inequities in the world associated to wealth, labor, human rights, and political power (Sennett). In addition to this, there are challenges associated with neo-liberal motivations and ideologies for problem solving that are tied to differentials in power between organizations like NGOs and the populations or societies targeted by and dependent upon such organizations. The consequences of all these disparities are worsened for many indigenous peoples who do not have accessibility to communications infrastructure and digital literacies for the production and reception of information. All of these aforementioned factors erode at the sovereignty of indigenous peoples, not only with respect to a group's social, political, cultural, and economic self-determination, but with regards to something much more fundamental — a person's own physical body.

Linked with the globalization of today is the global network of communications technologies that make up the World Wide Web, also referred to as the Internet. In the case of electronic technologies, globalization requires all nations to have access and (or) awareness of contemporary electronic technology. Yet despite the growth in worldwide communications infrastructure among “developed” nations, there continues to be what is called a “digital divide” among nations. This divide is especially pronounced among developing nations and indigenous nations. The “digital divide” represents the difference between people who have Internet access and people who do not. It also represents the difference between those who have access to high-speed Internet connections and those who have access to slower connections. Ultimately the overall divide in access and the quality of resources represents inequities between peoples and communities at both domestic and international levels.

In the United States, the domestic digital divide is most apparent in the lack of access to communications infrastructure currently faced by many Native American communities (Bissell 129-130). With advancements in technology complemented by the efforts of numerous private foundations, government initiatives, Native American governments, and higher education initiatives, the gap in Indian country is expected to narrow (134-149; Gordon, Gordon, and Dorr 428-434; *internet.org*). In an effort to respond to global change, many Native American nations intend to exercise their sovereignty within the cyber landscape, and many of its peoples have determined that they want access to the Internet (“Improving Communications”). This determination is influenced by scenarios where many people are required to use electronic technology for access to resources like online applications for jobs and services (even when accessibility to the Internet remains limited, or when the people have not acquired the necessary computer literacy skills). As many rural indigenous peoples await access to the Internet, the apparent lag in the development of infrastructure represents a valuable opportunity for indigenous peoples, who are yet to be affected by these changes, to prepare for the arrival of these technologies that will undoubtedly impact their way of life.

As many indigenous peoples prepare for the arrival of Internet access, indigenous communities can begin to position themselves to become active participants in the appropriation, adaptation, innovation, and creation of technologies intended to *benefit* their communities. Early consideration of technological sovereignty will allow indigenous peoples time to prepare ideas and protocols that position technology to honor the values, needs and desires of their respective communities. This is opposed to

assimilating to the needs and values of the market structure and/or political and economic interests of those who have deployed electronic technology, and who are seeking to impose this technology, as-is, into a given indigenous context (*internet.org*).

Electronic technologies like digital devices (smart phones, media players, tablets, laptops, etc.) are becoming ubiquitous throughout many parts of the world. Corporate forces are currently creating and defining new markets via technology-transfer to all corners of the world (Strange; Sennett; Marazzi; Friedman). This is having drastic impacts on developing nations; because corporations seek to expand their markets, developing nations represent a large untapped market potential (*internet.org*). Global Internet access is becoming established through the expansion of wired and wireless networked communications infrastructures, and Internet accessibility will bring peoples around the world online as potential consumers.

In the context of global market systems, the large number of resources invested annually into the dialogue between the corporation and consumer is an important aspect for indigenous peoples to consider. Many theories suggest that the goal of the market is to promote individualism. One of the functions of this is to create consumer demand through the phenomenon of individual desire (Moyers). For example, in what is considered a “mainstream” U.S. consumer society, corporate uses of mass media are designed to drive consumer behavior by promoting an individualistic and materialistic culture — a “me” culture — which is celebrated as a capitalist value (Adorno and Horkheimer, 113, 124-126, Virilio, *Speed and Politics* 128). From many indigenous cultural perspectives, these capitalistic implications and the subsequent shift to an

individualistic “me” culture are in many cases unacceptable to many indigenous communities whose way of being centers on the needs of the group and not the individual. Through this alone, the ongoing indigenous resistance to colonization continues: many indigenous peoples do not want to assimilate to colonizing and (or) neo-liberal ideas of culture.

In addition to the issue of individualism, the market is based upon competition where there are winners and there are losers, and everything sacred gets turned into a commodity. Unfortunately the work of colonization, imperialism, and capitalism are based upon opportunism (taking from others) and competition, and not on cross-cultural co-intentionality. Historically these forces have applied weapons and financial technologies to assure global political manifestations of globalizing ideologies. Throughout more than 500 years of colonization, indigenous peoples have had little recourse but to adapt to changes, but often doing so while resisting assimilation. The expanding use of global electronic technologies like the Internet foreshadows growing impacts and changes on the lived practices of all individuals and cultures. In this context indigenous sovereignty will require an indigenous re-imagined ceremony of electronic technology, an indigenous electronic technology capable of advancing the self-determination of indigenous peoples by providing protection from assimilation.

Despite the powerful influences of marketplace culture, many indigenous peoples have proven to be extremely resilient in upholding their cultural values (Mizrach). Indigenous peoples throughout history demonstrate the ability to resist assimilation through appropriated and modified uses of foreign technology (Weatherford cited in

Mizrach). Some scholars suggest that indigenous control of electronic technology, a continued resistance toward assimilation, continued practices of indigenous knowledge and the exercise of environmental consciousness may be what allows for communities to take control of their sovereignty on a global level within the global forum (Montiel, Atencio, and Mares; Weatherford cited in Mizrach).

This will require a great focus on cultural sovereignty, perhaps even necessitating the use of new ceremonial implements — re-imagined ceremony — that use electronic media (Wilson 90). Additionally, given the opportunities offered by the Internet, as it stands, it is possible to mobilize and sustain communities through the use of networked technology because networks are about connections and relationships. Going back to Enzensberger, networks can lead to the decentralization of power, and can help groups prevent the imposition of values by others (Enzensberger 265-266, 269-270).

One example of the practice of technology appropriation is Chicana/o *rasquache* (Ybarra-Frausto). Through this tradition, Chicana/o communities have demonstrated their ability to be creative and resourceful with foreign technological artifacts while keeping within the frameworks of their cultural systems. Chicanas/os have innovated designs for community and the home through processes of *hacking*³⁶, *circuit bending*³⁷, appropriation, recycling, and adaptive reuse. They have employed these methods through a process of creative improvisation in order to transform foreign artifacts into culturally situated implements of symbolic, aesthetic, spiritual, functional, and local economic

³⁶ I refer to hacking as a way to describe the process of breaking into a designed artifact. This is either an artifact that is “virtual,” like software, or an artifact that is physical like a laptop computer.

³⁷ Circuit bending is the dismantling and rewiring of circuits, which may include adding new components to create new circuit designs that perform new functions.

value. One example of this takes place during the Mexican indigenous ceremonial time of *Días de los Muertos*. Throughout *Días de los Muertos*, Chicanos construct altars to memorialize their ancestors. Due to limited access to material resources, Chicano families learned to employ *rasquache* practices to create ceremonial altars to remember their ancestors, a practice considered today as a tradition. In the case of these altars, what is tradition today was once a re-imagined ceremony that emerged out of a need to be pragmatic and resourceful. This kind of practice by indigenous peoples continues to inspire culturally responsive innovation, and can extend indigenous media frameworks for design (Nango and Thoresen). For the purposes of survivance in a digital age, it is imperative that indigenous peoples continue to apply traditions such as Chicano *rasquache* to practices of electronic technology.

With large-scale access to technology, an individual with Internet access can instantly access and distribute information throughout the world with the single click of a button. Without accountability, this powerful interaction of distribution can be initiated by a singular person with no regard for whether information is private, or uniquely for a particular group or community, or whether the information is general and intended for larger public consumption. Meanwhile this same person can also have instantaneous access to just about any kind of information imaginable (even what would seemingly be the private information of others), which is stored somewhere within the tens of millions of server locations throughout the globe³⁸. Access and distribution of information over

³⁸ Interestingly many of these servers reside on the traditional homelands of indigenous peoples, drawing into question indigenous sovereign rights to cyber territories (space on the Internet). In this context *Tecno-Sovereignty* is the claiming of indigenous cyber territory, or the claiming of an indigenous electronic

the Internet has rhetorical and physical consequences, and requires an ethical framework in accordance with indigenous protocols for digital media to be appropriated and repositioned as indigenous media. To complicate the power of digital media in the hands of individuals, the networked devices that host such a plethora of information also form a highly mediated environment through which the locations, behaviors, and activities of all connected humans are constantly sampled and archived for information retrieval (McLuhan and Fiore 12). This allows for governments and corporations to survey human activity for the purposes of maintaining social structures, marketing, law enforcement, national security, and so forth. This surveillance can present larger social, legal, and ethical concerns for groups and communities affected by the dissemination of private or sacred information.

Additionally, a sense of place within cyberspace can be described as online Internet communities, which all together host over three billion people worldwide (“Internet Users in the World”). These Internet users make up communities of practice for everything imaginable. In highly mediated countries, an individual member of a community can use wireless technology that allows mobile access to communication networks regardless of where he or she is geographically located.

Through the Internet, a person can be physically alone in a remote and isolated physical area and defy the nature of this scenario by visiting with someone somewhere else on earth through a video chat. This is not necessarily a bad thing. However, similar to this sense of place is the concept of bending time and space, which is used by the

commons. I use electronic commons to refer to the airwaves (UHF, VHF, FM, AM), telecommunications infrastructure (fiber optic trunks), digital content, indigenous intellectual property, e-commerce, etc.

United States Government to remotely execute people with the control of war machines through a computer located safely on the other side of the globe (Schwartau 13; Virilio, *Speed and Politics* 167). On the other hand, and simultaneously using the same network infrastructure, a doctor may bend space in order to perform real-time robotic surgery on a patient located in a different hemisphere by manipulating tangible tools or interfaces.

As technology extends the capacities of humans, in terms of indigenous technological sovereignty, the impacts of technology upon the natural environment and concepts of time-space, as well as its associated worldviews of desired control and immortality must be considered with caution (Yazzie-Burkhart 26).

Perhaps a discussion of place, as it applies to technology and computation, best provides further insight into the effects that pervasive electronic technology can potentially have in the context of indigenous cultures. As stated before, relationships with place provide sources of power that define many indigenous worldviews (Stoffle, Zedeño, and Halmo). The ability of computation and communication to change our understanding(s) of place, space, and time can be demonstrated by any person with access to electronic networked technology. The ability of networked digital media to reform space, place, and time, if applied in accordance with many indigenous frameworks, will undoubtedly shape both indigenous perspectives and indigenous responses as self-determined expressions and uses of electronic technology.

It is important for indigenous peoples to reflect and analyze the compromises and appropriate courses of action inherent in the appropriation or adaptation of electronic technology through the perspectives of their communities (Bissell 142-144). History

abounds with examples in which foreign technologies have been used to subvert, annihilate, and/or colonize indigenous peoples and exploit natural resources. Few would disagree that the use of digital technologies will undoubtedly impact the cultural lived experiences of those who interact with it. However, the adaptability and dynamism of today's electronic media means that it can easily be shaped to maintain and promote the value systems of those who create and control it. This malleability allows it to be easily formed by virtually any electronically literate person with access to this technology. This accessibility to controlling media can benefit indigenous sovereignty greatly through electronic innovations for learning and raising community consciousness. However, this kind of action necessitates responsibility on the part of indigenous creators and users of electronic technology, and a reflective practice informed by indigenous knowledge systems advised by community elders and leaders.

III. Indigenous Theory of Electronic Media

Complicating the inherent challenges associated with electronic media for indigenous peoples, which are challenges associated with the reality that, by and large, electronic technologies are derivative of Western and multinational corporate worldviews, is the argument that oral literacies are a major communication property of electronic media. This aspect of electronic media theoretically interfaces with indigenous traditions, connected-knowledge systems, and oral communications modalities — making it a logical extension of “Rhetorical Sovereignty” (Deloria Jr., “We Talk” 29-30; Lyons, “Rhetorical Sovereignty”).

Grounding the design and use of electronic media through indigenous knowledge systems is similar to the exercise of rhetorical sovereignty. In his essay “Rhetorical Sovereignty: What Do American Indians Want from Writing?” Richard Scott Lyons (Ojibwe/Dakota) describes “rhetorical sovereignty” as the control of meaning (aesthetic, legal, and pedagogical) via uses of literacy (reading and writing) (Lyons, “Rhetorical Sovereignty” 447, 458-466). In other words, rhetorical sovereignty is the design, distribution, decoding, and comprehension of the written medium that reflect the practices, worldviews, intentions, and aspirations of the people it represents. Naturally, the extension of rhetorical sovereignty to practices of electronic technology, such as digital media literacy, would include the control of meaning through indigenous uses and innovations of electronic media. The following tenets encompass a theory of the media informed by indigenous knowledge systems and Western media theory:

1. In many indigenous cultures, meaning is often based upon esoteric knowledge specific to the relationship between a given community and the particular land it inhabits (Coffey and Tsosie, 204-206). Within this knowledge paradigm, mediums such as oral literacy are connected to place, and are embedded as part of a community’s orientation to its local environment. The medium of electronic technology and many of its uses for communication can be scaled to function in the same way. An indigenous bioregional and community oriented practice of electronic technology leads to appropriations and re-adaptations that transform it into unique place-based innovations. One of the challenges associated with this

idea is that today's electronic media is globally networked and easily replicated, and can be instantly distributed throughout the world. Because of this property, indigenous media must be secured to ensure the protection of community dialogues and sacred indigenous knowledge.

2. Since electronic media is a dynamic tool for communication, like all tools it can be used in ways that are destructive, but it can also be used in constructive ways. For example, because electronic media is a tool, and like many other tools, it can be used to facilitate indigenous sacred traditions which are “. . . responsible for teaching morals and ethics. (Beck et al. 8)” The appropriation and innovation of electronic media as a place-based indigenous tool requires focused and reflective community decision-making with respect to electronic technology constructions and uses. Since electronic media may uniquely respond to a given place, it also requires stewardship by appropriate community knowledge keepers who understand its responsible use within a given community and biome. Aside from security of indigenous knowledge, this stewardship includes the teaching of design methodologies, methods of production, and ethical uses in accordance with the values of a given community.
3. A steward of indigenous media understands the power and responsibilities associated with uses of electronic media. The real-time nature of today's digital technology allows people to enact consequential decisions that have immediate impact with the immediacy of a button click. This is a

case where efficiency can take precedence over reflection. To reverse this so that reflection takes precedence over efficiency, the greatest degree of responsibility in making and enacting a decision must be exercised; the creation of indigenous media must extend indigenous knowledge and values associated to story, place, time, and purpose. The values associated to these elements are often referred to as the 4 R's standing for Respect, Relationships, Reciprocity, and Responsibility (Brayboy et al. 423). The 4 R's are a critical component of Tecno-Sovereignty, and many indigenous peoples have developed effective protocols to promote these values. The protocols within the exercise of Tecno-Sovereignty require patience, ways of listening, and critical thinking skills that are applicable to indigenous users and creators of electronic technology.

4. Through the acknowledgement that media can be used to facilitate sacred traditions, such as practices of language, a community's development and use of its own electronic media can potentially contribute to self-determination through the logic that derives from indigenous knowledge systems. Western influenced electronic technologies for mediating complexity use scientific data that enable people to understand the components of systems in relationship to each other. Indigenous science has its own methodologies and methods for doing this, which are framed "to include spirituality, community, creativity, and technologies that sustain environments and support essential aspects of human life" (Cajete,

Native Science 3). Perhaps these methodologies and methods must also be applied to the ways electronic technologies are extended. In many ways, media, for indigenous peoples, is like a *flint knife tongue*³⁹ (oral literacy): it is a tool that can be used to construct, but it can also be used in destructive ways. This indigenous wisdom reminds us why the 4 R's are an essential part of Tecno-Sovereignty.

5. Electronic media possesses the ability to create, sustain, or destroy relationships. It is influential and transformative to people who use it, and it feeds into a group's social network, which extends to the surrounding bioregional ecology. This property of the media can both benefit and threaten the sustainability of a given culture and the environment. From many indigenous perspectives, relationships extend beyond those a person has with other people; they also include relationships and reciprocity with and among animals, the natural environment, and the spiritual world. An indigenous electronic medium and media has to support these relationships.
6. Indigenous media presents a great potential for promoting dialogue and connected knowledge (this is in many ways the nature of the Internet). Since media can be represented through a circular system of communication or feedback loops, indigenous worldviews might suggest

³⁹ A flint knife tongue is an indigenous Mexican concept that comes from the Nahuatl word "Tecpatl," which means flint knife. Tecpatl is a powerful tool that comes with responsibility on the part of its user. "Tonatiuh," the sun, possesses the flint knife tongue, which represents its power to give life and to take life. This power emanates from Tonatiuh's ability to speak (use) language.

that contributions and connections made through media propagate through circles and spirals. In other words, the interconnectedness and reciprocity of everything, in both giving and receiving, negates binaries such as a broadcaster and receiver. Such an idea assumes that listening, for example, if done with patience, focus, empathy, and self-reflection, is just as much a form of giving as it is a form of receiving. Through indigenous philosophies such as this, it may be culturally relevant for electronic media to be framed as a means through which sacred dialogues can be facilitated.

7. For better or for worse, today's networked electronic technology influences the emergence of societal consciousness. Within this network, media content is often framed as a commodity and is therefore used as a means to facilitate the economic expansion of markets. However, a shift away from this occurs if indigenous peoples position electronic media as a dynamic tool capable of facilitating what is understood to be sacred to its diverse communities. To do so will require innovations and uses applicable to the sustainability of one's unique biome and culture. One way for this to occur is through indigenous innovations emergent through re-imagined ceremony. Electronic focused re-imagined ceremony allows communities to develop their unique methodologies and methods for making electronic-cultural implements reflective of their unique aesthetic, symbolic, and functional values. These kinds of implements can be an extension of the living relationships and sacred connections that

indigenous peoples have to their respective lands, and to each other (Stoffle, Zedeño, and Halmo).

IV. Examples of Indigenous Technological Self-Determination

The development of indigenous media theories and practices can stimulate a community's awareness of the potential for digital technology to strengthen the exercise of self-determination (Montiel, Atencio, and Mares 9-68). Self-determination via electronic technology within the context of globalization can provide access points for indigenous communities to participate in global dialogues as politically sovereign peoples. Indigenous media also creates the potential for the emergence of co-intentional cross-cultural partnerships that recognize and respect indigenous sovereignty. Techno-Sovereignty will require innovations and best uses of electronic technology by indigenous communities themselves through the practice of cultural sovereignty and co-intentional cross-cultural partnerships led by indigenous peoples. This approach centers the ability of indigenous peoples to "exercise their own norms and values in structuring their collective futures" (Coffey and Tsosie 191).

As a part of the potential for indigenous peoples to prepare for the implementation of electronic technology, it is beneficial for indigenous media and technology theories to extend indigenous knowledge systems. This may include the notion that electronic technology can facilitate the *sacred*⁴⁰ through a people's orientation to digital media as a

⁴⁰ According to authors Peggy V. Beck and Anna Lee Walters, in their book titled *The Sacred: Ways of Knowledge, Sources of Life*, "Sacred means something special, something out of the ordinary, and often it concerns a very personal part of each one of us because it describes our dreams, our changing, and our personal way of seeing the world. The sacred is also something that is shared, and this sharing or *collective* experience is necessary in order to keep the oral traditions and sacred ways vital. In discussing the sacred, it

tool. This orientation extends traditions of innovation and appropriations that can redefine electronic technology, as Native Americans have done in North America with foreign technologies throughout over 500 years of colonial resistance. The creative forms of appropriation by indigenous peoples have effectively demonstrated self-determination and resistance to assimilation in the face of oppressive and inequitable conditions. The application of this knowledge, ability, and tradition could lead to outcomes that include the development of electronic technology developed by indigenous peoples themselves.

As many of the world's citizens increasingly engage and develop forms of electronic culture, there is an increase in the creative use of marketplace technology by people of diverse indigenous perspectives. Indigenous artists are among the leading exemplars of participants who encourage people to use their cultural practices for the innovation of digital/electronic technology. Some examples of this include digital projects that embody cultural, social, and political discourse from diverse indigenous perspectives to accomplish culturally embedded learning, cultural sustainability and revitalization, and decolonization. The performance art project *Radio Healer* is an example of a group whose participants express indigenous self-determination by exploring uses of technology through cultural frameworks appropriate to the group's function within its community. The group recognizes its potential to create cultural meaning, and facilitates the emergence of new community knowledge about electronic

might be said that there is two sides to it: the personal, ecstatic side that all individuals find hard to describe, and the part of the sacred that is shared and defined year after year through oral histories, ritual, and other ceremonies and customs (1992, P. 7).” This definition seeks to describe indigenous notions of the sacred.

technology through the creation and use of electronic indigenous tools. The following statements are presented on the project website:

Radio Healer is an indigenous media practice where artists mentor each other through a collaborative expression of music, story, and dance, which includes the use of indigenous electronic tools and other re-imagined instruments, as well as traditional ceremonial implements. Indigenous electronic tools are created and used in Radio Healer to re-imagine ways to practice indigenous knowledge and cultural traditions within the context of the digital age. Project artists achieve this by applying Chicana/o Rasquache and Native American adaptive reuse traditions for the innovation of indigenous electronic technology. Rasquache and adaptive reuse traditions exemplify and celebrate the creativity and adaptive innovation spaces of Chicana/o, Native American, and other indigenous cultures throughout the world. These traditions demonstrate adaptations and appropriations of foreign cultural artifacts and materials, as well as the use of local materials to innovate functional and aesthetic designs based on cultural ways of being, learning, valuing, believing, and acting upon the world. Rasquache is an innovation-framework practiced by Chicanas/os, creating outcomes that demonstrate self-determination and survivance (many indigenous communities around the world have their own versions of Rasquache). In the case of Radio Healer, Rasquache practices are applied to the aesthetic and functional design of indigenous electronic tools that are constructed through a process of hacking, circuit-bending, appropriation, recycling, adaptive reuse, and creative improvisation (Radio Healer).

Through these efforts, the indigenous artists in this collective tactically decolonize media to inspire public dialogues. Their activities demonstrate that it is possible for people to evoke cultural knowledge for the distinct purpose of innovating electronic media literacies and technologies that embody indigenous values. *Radio Healer* contributes to the vitality of its communities by leveraging the power of electronic media to construct relevant indigenous cultural places for social gathering and dialogues.

One purpose of *Radio Healer* is to express critical thought regarding the indigenous cultural implications of electronic technology. The cultural tradition of

Chicano rasquache and Native American adaptive reuse is used to construct innovative tools that disrupt and complicate mainstream uses of digital media. Using these traditions, project artists complicate Western utopian ideologies and corporate messages encoded by advancing manufactured technologies. This presents audiences with abstract critiques of technology that encourage critical thought regarding the pervasive technologies that affect our everyday lived experiences. In *Radio Healer*, rasquache practices become important to the design of electronic tools for the performance of music, the creation of digital media, and the promotion of storytelling and dance. These tools allow the artists and audiences to uncover and generate knowledge through a re-imagined ceremony inspired by indigenous knowledge. According to their website, the Native American and Chicana/o “ . . . artists of Radio Healer contribute this practice as members of their respective cultures for the humanization of each other and all peoples (*Radio Healer*).”

Another example of Tecno-Sovereignty is the multimedia opera *Imperial Silence*. This piece, directed by John Jota Leños, is produced by *Burning Wagon Productions*, a group comprised of Chicana/o and Native American artists. *Burning Wagon Productions* appropriates standard off-the-shelf technologies such as commercial animation and video editing software to hack the tradition of opera, and present an indigenous aesthetic of music, dance, storytelling, and performance. This allows the group to offer indigenous perspectives on current events. For example, *Imperial Silence* comments on issues such as the war on terror, and the border “problema.” It does this by expressing Chicana/o and Native American humor through the appropriation/adaptation of Western stories. During Act II of the opera, artists weave re-imagined narratives together to parody both their

own culture and the dominant culture by creating a scene titled “Deadtime Stories with Mariachi Goose and Friends.” In this work, the use of media is tactical because it uses a dominant cultural artistic framework (opera) to communicate indigenous expressions of rhetoric and culture. Audiences are told stories through *Días de los Muertos* traditions and American indigenous traditions by evoking the spirit of Coyotl sometimes referred to by First Nations people as the “trickster of learning” (Archibald, “Coyote’s Story” 1990). Audiences comprised of diverse cultural backgrounds are able to laugh together through the presence of Coyotl; humor becomes a way to ease social and racial tensions in order to provide a site where culturally diverse audiences can reflect upon subjugated histories and perspectives.

In addition to these artistic examples, indigenous technologists exercise Tecno-Sovereignty for cultural sustainability and education by creating applications for mobile devices, personal computers, and experiential (embodied, full-bodied interactive) media systems. This includes indigenous software applications for indigenous language learning and preservation, such as the Cherokee Nation-led creation of a Cherokee computer font, keyboard, and Cherokee syllabary as part of computer operating systems and applications by Apple, Google, Microsoft, and Facebook. This and many other indigenous led examples demonstrate the development of computer software and interface strategies that emerge through the unique design sensibilities of indigenous peoples. This Cherokee National exercise of Tecno-Sovereignty provides a powerful infrastructure for Cherokee language immersion, and the use of Cherokee as a language to interface with the Internet.

In keeping with indigenous sensibilities, indigenous innovations such as that demonstrated by the Cherokee Nation in partnership with corporations are often part of education technology initiatives led by indigenous people who understand these applications must be informed by indigenous “learning while doing” philosophies (*Technology to Preserve Tradition*, 2006; *Native Language Aps*, 2009). An example of such an application is an indigenous digital media interaction called the *Mediated XicanIndio Resolana*. This is an interactive rhetorical space that utilizes a mixed reality system for learning called SMALLab (Birchfield 2). The indigenous led design of the *Mediated XicanIndio Resolana* is a “cyber-age” interpretation of the traditions of the Northern New Mexican Resolana. This is a tradition written about by the late University of New Mexico Professor Tomás Atencio, memorialized by New Mexican communities as a knowledgeable community elder. Atencio cites the Northern New Mexican Resolana as a cultural place and process where community members gather to partake in socio-cultural community dialogues (Montiel, Atencio, and Mares xi).

In the case of the *Mediated XicanIndio Resolana*, multiple participants gather in physical co-located space to engage in dialogues about a special topic. In this space, discourse is coupled with the real-time and embodied manipulation of digital (sonic and visual) media through interaction protocols and symbolic body movement gestures. This cultural expression serves as a method for social computation allowing participants to map the course of dialogue and the connections that weave the group’s ideas together (Martínez et al. 165-167). In the *Mediated XicanIndio Resolana* computational maps serve as a guide for participants to understand the unfolding trajectory of their dialogues.

This becomes a type of visual feedback that helps participants understand aspects of their dialogue. This socio-cultural interactive and embodied rhetorical space promotes oral literacy skills through dialogues that enable reciprocity, reflective listening, and the creation of knowledge and meaning through storytelling.

The *Mediated XicanIndio Resolana* is a culturally based education technology used in schools to practice, what indigenous education scholar Sandy Grande refers to as *Red Pedagogy*. This learning includes the acquisition of traditional oratory and listening skills through collective student practices that raise social justice awareness and promote social and cultural currency in the classroom (Grande 250). According to Vine Deloria Jr., educational policies privilege professionalism over relationships (“Knowing and Understanding” 43). The *Mediated XicanIndio Resolana* is an intervention designed to respond to Deloria’s critique. It responds by foregrounding the importance of establishing and sustaining meaningful peer-to-peer relationships in the classroom. It recognizes the importance of the sustainability of indigenous social networks as a central feature of learning, culture, and self-determination.

Deloria’s concern is based on the idea that students from U.S. educational systems are ideally armed with technical knowledge, and because the emphasis is on technical knowledge acquisition, people become displaced as “products” of an educational system. As products, people do not learn to apply their knowledge according to protocols or codes of ethics based upon principles like the 4 R’s (Brayboy et al. 423). In contrast to instrumental relationships, meaningful relationships are built upon notions of love, compassion, empathy, and kinship. Indigenous ways of learning are based upon learning

environments that foreground the development of meaningful peer-to-peer relationships. This paradigm creates supportive and inclusive learning communities where students take responsibility for each other's successes. Through practices of responsibility towards others, a person's identity emerges via the contributions s/he makes toward the wellbeing of his/her family, people, and place (Brayboy and Maughan 15).

V. Indigenous Media Framework

While the examples in the previous section demonstrate the power of digital technology in the hands of indigenous cultural workers, these workers also demonstrate it is possible for communities to benefit from electronic media practices extending indigenous technology. In order to operationalize Tecno-Sovereignty by the hands of indigenous community members, peoples must have access to electronic media technology, and indigenous places and processes for acquiring electronic media literacy skills. In order for electronic media literacy pedagogy to connect with a given indigenous community, learning practices and environments must reflect the indigenous knowledge and practices of the community. In addition to this, tecno-cultural workers also express the need for the development of "indigenous media" through new tools and frameworks for collaborative and indigenous electronic technology design. To achieve this media, new innovations must be directed by community members themselves, and through co-intentional cross-cultural collaborations promoting indigenous self-determination.

An example of an indigenous media framework created to promote indigenous innovation was developed by a cross-cultural partnership at the University of Maine, *Still Water for Network Art and Culture*. This framework states:

To study indigenous media is to study what it means to be and become indigenous, and how and why we would reclaim and protect our ecological “commons,” both bioregional and electronic.

Indigenous media practitioners explore new political strategies and tools, especially the power of networking like-minded communities for local/global actions and sharing of resources. Yet they also attempt to learn from the social, cultural and ecological practices of indigenous peoples, especially those in our own regions. Conversely, indigenous media practitioners are often committed to helping indigenous people regain and protect their sovereign rights (“Indigenous Media”).

Indigenous media practitioners that include artists and scientists have followed this framework to innovate and use technology for the following intentions:

- a. *Self-determination*
- b. *Cultural sustainability and pedagogy*
- c. *Environmental Sustainability*
- d. *Cross-cultural Partnerships*

The nature of indigenous knowledge systems is evident in the framework led by the indigenous people at *Still Water*. This is because the writers of this framework understand that, to be indigenous, one must have knowledge of one’s ecological commons as well as know the reason for why it is important to understand this connected knowledge. In other words, implicit in this framework is the recognition that one exists within a relationship with the world and that one understands the connections that they have with their particular bioregion and community members. The people at *Still Water* understand that indigenous media is not universal, but is tied to bioregional ecology and an electronic commons where “like-minded” communities can share resources with one another. It is a critical goal of the *Still Water* framework to ask those who wish to practice indigenous media to be “committed to helping indigenous peoples regain and protect their sovereign rights” (“Indigenous Media”). This indigenous media framework

represents socially responsible forms of innovation because it does not assume that a given perspective or design is appropriate for all cultures. *Still Water's* vision for indigenous media provides communities with an example of how some indigenous people are defining their electronic commons to encourage social, cultural and ecological practices especially tied to a particular region.

Conclusion

Utopian (techtopian) ideologies often drive the impetus for Western and Euro-American innovation (Kozinets 869). Within this technology-equals-progress (human improvement) belief, the marketplace takes no responsibility to exercise any sense of accountability toward indigenous peoples and their homelands. Western innovation and consumption is considered by western societies as a secular expression, and is highly valued as a status quo. These forms of innovation are designed to promote a market designed to serve the desires of the individual. This form of market-based culture imposes universal policies that fail to recognize, value, and protect the rights and resources of indigenous groups residing on their own spiritual/ancestral homelands.

It is important to note that the creation of Western knowledge is historically motivated by ideologies like entrepreneurship and utopia. Ideas like entrepreneurship and utopia are often viewed as moral obligations associated with a desire to improve the human condition, and to entitlements justified by religious ideologies such as *God-given rights* and *pre-destiny*. This worldview has led to many exciting, creative, and useful technologies such as digital electronic technology, but has also led to the creation of negative unintended consequences that are global in scale.

Digital electronic technology is more adaptable than anything indigenous peoples in the Americas have encountered in over five centuries of colonization. A pervading ideology of technology in capitalist societies is to support a consumer-based marketplace culture. This has given rise to a “consciousness industry” in which western theorists debate the following positions: a) that media influences the perceptions and behaviors of people to varying degrees; and b) that the media is controlled by people as it responds to their desires and anxieties as consumers (Adorno and Horkheimer; Innis; McLuhan; Williams; Baudrillard, “Requiem for the Media;” Carey; Altheide). The debates implicit in these theories give rise to paradoxical dilemmas.

Because of the dilemmas that emerge in Western media theory, electronic technology must be approached with deliberate caution. The influence of electronic technology can radically transform and affect the social, economic, political, and cultural values, beliefs, and practices within any community. Electronic technology is a tool that has been used by the nation-state to wield powerful systems of control in various areas including the military, politics, law, education, and the global market. Historically this has been done to propagate the colonial project. As with written language, it will be necessary for indigenous peoples to engage electronic technologies, which means they may have to hack and change the rules governing them.

The underlying principle exigency that Tecno-Sovereignty attempts to address is: How do indigenous peoples acquire digital literacy without being assimilated by the digital technology? Perhaps a part of the answer to this question is indigenous re-imagined ceremony. Indigenous media can proceed as a re-imagined ceremony by

allowing communities to develop practices for making and using electronic implements that are aesthetically, symbolically, and functionally responsive to indigenous life with respect to all its diverse permutations. In order for Tecno-Sovereignty to occur, these implements must respond to the dynamic relationships and sacred connections of indigenous peoples to their given lands, to their specific languages, and to the relationships and responsibilities that members of a group have toward each other (Coffey and Tsosie; Stoffle, Zedeño, and Halmo). Tools are not disparate from a Critical Indigenous Research Methodology, where the 4 R's (Respect, Relationships, Reciprocity, and Responsibility) are paramount to this vision toward Tecno-Sovereignty (Brayboy et al. 423) — a vision arguing for the reflective and ethical design and practice of technology based on indigenous knowledge systems.

Essay 3.3 – Our Digital Tongue Is Tecpatl, a Flint Knife

Abstract

In this essay I refer to New Literacy Studies and Critical Race Theory to show how literacy⁴¹ in formal education is implicated as a tool for colonization. Within this context I define digital literacy⁴² as an extension of literacy. As a response to the colonizing potential of digital literacy, I emphasize its contrasting potential as a tool for enacting indigenous⁴³ self-determination⁴⁴. Through this, with respect for community elders and with awareness of diversity, I recommend that indigenous peoples throughout the world lead intercultural dialogues to consider the development of digital literacies based upon the vast diversity of indigenous worldviews. To provide entry points for dialogue, I call attention to Chicana/o folkloric practices and Native American Literacy.

⁴¹ Literacy is a technology: the reading, writing, and comprehension of text.

⁴² Digital Literacy is a technological upgrade to literacy, like literacy (vr. 2.0): it is the encoding, decoding, comprehension, reception, and distribution of digital media.

⁴³ The arguments in this paper are predicated on place, and for the purposes of limiting the broad term “indigenous,” as well as acknowledging the complexity associated with all things considered “indigenous” throughout the world, I use the term to refer to the indigenous peoples of the Western Hemisphere. This limitation in scope does not necessarily exclude indigenous peoples from other parts of the world, but it is an acknowledgement that “indigenous” refers to a vast diversity of peoples that do not exist reified as a single homogeneous group. Despite the diversity I am acknowledging, the indigenous peoples of the Western Hemisphere have all experienced colonization, they embody indigenous knowledge systems tied to the specific biomes they inhabit, and they maintain that they have originated and inhabited particular local geographies since the beginning, as told in their creation stories.

⁴⁴ Indigenous self-determination is local collective action by an indigenous group for the purposes of addressing identified local needs and desires. Indigenous self-determination can also manifest itself as an exercise of indigenous intercultural or international collective action to address the needs and desires of indigenous peoples within a more global context.

Introduction

The American linguist and philosopher, Noam Chomsky famously argues that the reading and writing of text is a cultural invention, and that language is a human instinct⁴⁵ (Chomsky 17). Later, linguistics scholar James Paul Gee references Chomsky's argument by explaining that, although language is the foundation of literacy, it can exist independently of text, and is a result of human evolution (*Situated Language* 19). He cites evidence showing that literacy came into being around 6,000 to 10,000 years ago, and was invented by only a few cultures, whereas language has been spoken among humans for hundreds of thousands of years.

Both Chomsky and Gee agree that reading and writing are not instincts, and thus cannot be acquired through socialization in the way that children are able to acquire language naturally. During a Fall 2011 course lecture, Gee stated that the ability to read and write must be learned pedagogically and maintained through practice, even though oral language is the foundation for literacy. I highlight these ideas because they illustrate to us that literacy is a cultural instrument, and an invented technology.

By situating literacy as a technology, I will now argue that imposing technology upon another culture is an act of ideological reasoning typically used to justify some opportunities at the expense of others. Literacy, for example, has been historically used to eradicate American indigenous cultures and assimilate its peoples for the purposes of

⁴⁵ Noam Chomsky's theory of language as a human instinct has been criticized by cognitive scientist and linguist Stephen A. Pinker in his book titled the *Language Instinct* (which has, in turn, been criticized by Geoffrey Sampson in *The Language Instinct Debate*) and by biological anthropologist Terrance Deacon who argues in his book *The Symbolic Species* that language co-evolved with the brain. In all cases, each of these scholars agrees that children acquire language through processes associated with socialization. The nature of these processes is also debated.

exploiting their land, markets, structures of governance, and connected knowledge systems (Archibald, “Coyote’s Story” 77; Lyons, “Rhetorical Sovereignty” 448; L.T. Smith 58-64; Vizenor 16). Using history as our frame of evidence, if we position digital literacy as an extension of literacy, we can gain insight into the potential implications of digital literacy.

Much like literacy, digital literacy is an idea with different meanings in different disciplines. For this paper, I use the term to mean the advancement of literacy through the encoding, decoding, comprehension, and distribution of what has become known throughout the world as digital media. Through this lens I will argue that, like its predecessor (literacy), colonization is endemic to its use and its hardware mediums.

In response to this new wave of literacy, I recommend indigenous-led cross-cultural dialogues that consider the development of indigenous digital literacies. As part of this, I also recommend the acquisition of digital literacy, critical assessments of western ideologies of technology via a shared intercultural indigenous lens, and the cross cultural co-intentional development of new digital literacies based upon indigenous worldviews for the purposes of indigenous self-determination in the 21st century.

By indigenous digital literacies, I am not referring to the adoption of conventional uses of digital media such as documenting and archiving indigenous knowledge or learning how to use commercially marketed software. On a deeper level, I am suggesting the use of *rasquachismo*⁴⁶ and other indigenous hacking and modding⁴⁷ such as Native

⁴⁶ *Rasquachismo* is the Chicana/o reuse and salvage of foreign materials to form innovative designs based on creative improvisation and cultural aesthetics (Ybarra-Frausto 128-150).

American adaptive re-use practices to re-form electronic mediums and digital media. Actions such as this, regarding appropriations of technology by indigenous peoples, have historically led to innovations that align with indigenous epistemologies, ontologies, and axiologies. Examples of this include the lowrider and contemporary pow wow regalia.

Perhaps in the context of contemporary indigenous efforts to control law, education, and aesthetics through literacy, it may also be timely to extend the same purpose to digital literacy (Lyons, “Rhetorical Sovereignty” 447). To do this, I recommend that we look to the work of Native American writers Craig Womack and Gerald Vizenor for guidance. These writers encouraged Native Americans to approach literacy as a culturally rooted ritual or a “re-imagined ceremony” (Blaeser 15-16; Womack 11-12). In Native American literature, this led to a new wave of story telling that is aesthetically “Native,” and that delivers Native American responsive content for all possible audiences.

I argue that the application of “re-imagined ceremony” to digital literacy can lead to innovations that mediate embodied ways of sustaining and repatriating indigenous practices (Martínez et al., “Culturally-Sensible Place-Making” 161-168). In other words, indigenous media can be strategically positioned to revitalize intergenerational connections often disrupted by mainstream digital media. This includes opportunities for

⁴⁷ Modding is a pop-culture slang term for the word modification. It describes the practice of modifying a tool or a game so that its functionality changes to perform in a way that is different from what it was originally intended.

indigenous elders to connect indigenous digital-natives⁴⁸ to the reasons why indigenous knowledge continues to be relevant.

New Literacy scholar James Paul Gee argues that digital literacy is a cultural invention that extends literacy (“The New Literacy Studies” 371). In a Fall 2011 course lecture, he stated that early evidence suggests digital literacy can lead to social inequities similar to those influenced by literacy. But to the contrary that digital literacy can lead to inequities, he also clarifies that digital literacy can allow people with no institutional language to proliferate institutions with innovations that often surpass the output of power-holding experts. This suggests that the average person in society has new tools that offer unprecedented levels of agency to transform reality.

To access and shape digital literacy and its benefits, I humbly recommend that indigenous peoples claim their digital commons by developing approaches to digital literacy based on indigenous grounds⁴⁹. This requires building local capacity through pedagogy that synthesizes media arts and indigenous knowledge (Lameman et. al. 105). Indigenous digital media learning will help put indigenous digital knowledge into cultural practice. I argue this type of activity will allow indigenous peoples to return to tradition through new forms of revitalization (Warrior 93-94). It also provides indigenous opportunities to ontologically determine best practices for digital media through intergenerational dialogues that include design processes, intergenerational knowledge transfer, and elder critiques.

⁴⁸ The term digital-native refers to digital media savvy indigenous people, as well as those who were born into the world of pervasive digital media.

⁴⁹ By indigenous grounds, I am referring to indigenous epistemology, ontology, axiology, in relation to a sense of local place. As a metaphor, I am referencing indigenous ceremonial grounds.

Perhaps we can begin this work by asking critical questions such as: What do indigenous peoples want to get out of electronic technology? Can electronic technology be meaningful within the framework of indigenous cultures? What might indigenous electronic innovations look like? These questions are similar to the singular one posed by indigenous scholar Richard Scott Lyons: “*What do American Indians Want From Writing*” (447)?



Figure 1: Native American electro-acoustic flute performance, by *Radio Healer*

In the work *Radio Healer*, artists use electronic tools they constructed in order to manipulate digital media as part of dance, storytelling, and song. To create these indigenous implements, they used their digital literacy skills and indigenous knowledge to repurpose salvaged hardware through hacking, to design software, and to facilitate small community gatherings. Photos are by Lee Hyeoma, 2011. Pueblo Grande Museum, Phoenix, AZ.

A Definition of Digital Literacy

Digital literacy refers to many different meanings. To build upon what I defined in the introduction, I use the term to include human interaction with all meaningful things digital, such as artificial intelligence, images, moving images, sounds, haptic feedback (like vibrations from a smart phone), and text. These modalities can be experienced through an infinite number of combinations, embodied interactions, and contexts. Digital media experiences depend on the capabilities of computational hardware, human interface hardware (such as a computer mouse, video game controllers, motion capture, etc.), software, and their accessibility.

An important aspect of digital literacy requires people to understand dynamic relationships between multi-modal events of digital media within complex systems composed for human experience. This is never more present than in a video game or a work of interactive digital art. These expressive forms use relationships between sounds, images, text, physical feedback, software engines, game mechanics, and human interaction to create systems that can be made meaningful by the end user. To do this, the following digital literacy skills are required: the abilities to encode, decode, comprehend, distribute, participate (collaborate), and connect knowledge (share).

Not surprisingly, these core skills look very similar to what is required for literacy, but even more than this, when we look at these skills as a set of interrelationships, they describe the dynamic ways by which indigenous knowledge systems work. To make these core skills more explicit, a digitally literate person is one that is able to encode, decode, and comprehend images, sounds, text, and systems, as well

as his/her embodied relationship to these elements. The usefulness of these skills are demonstrated by video gamers who collaborate over the internet to play games, analyze games, critique games, develop online communities, hack and modify games, and create new games from scratch. To achieve this they have created their own digital literacies within communities of practice. I believe indigenous peoples can do the same to create indigenous media⁵⁰.

In literacy, it is not enough to simply know how to read and write; it is equally important to know how to comprehend text, and how to exercise critical thought when reading and writing. Additionally, it is not a sufficient practice of digital literacy and dialogue to act only as a receiver. When appropriate, it is equally important to produce digital media. When we extend these values to digital literacy, the following two functions emerge: (a.) the exercise of thought, reflection, comprehension, and the creation of meaning using language to interpret media that is received (decoding for consumption); and (b.) to apply critical thought and an understanding of dynamic systems to express ideas using digital media for the production and broadcasting of ideas (encoding for production).

Digital Literacy: Literacy ver. 2.0

Now that I have defined what I mean by literacy and digital literacy, I will make explicit the relationship between these ideas. In this section I situate digital literacy as an updated version of literacy. To do this, I will point to *New Literacy Studies* (NLS), which offers an understanding of literacy that stems from social, cultural, and historical

⁵⁰ Indigenous media is study and practice of media technology to express, address, and support: indigenous life, self-determination, cultural preservation.

perspectives about language. This goes against a behavioral sciences approach, which maintains that language is contained in the mind of the individual (Gee, “New Literacy Studies” 372-374). NLS asserts that languages exist within cultures and are specifically expressed within communities of practice.

Conclusions made by NLS about literacy are now being extended to digital literacy by a recently developed framework called *New Literacies Studies*. What differentiates New Literacies Studies from NLS is that it seeks to extend itself to other literary expressions involving practices of technology that go beyond print. In addition to its expanded view of literacy, *New Literacies Studies* also takes a social and cultural approach to literary practices of technology. Because of this, both NLS and *New Literacies Studies* stress that “. . . print or digital media do not have universal meanings or effects on people” (Gee, “New Literacy Studies” 372). This suggests that print and digital media function identically as media from which meanings are comprehended.

Social Linguistics scholar James Paul Gee extends this view by suggesting that meaning is determined by what he refers to as “. . . Discourses with a capital ‘D’” that exist within cultures and social groups (*Social Linguistics* 151). He describes Discourses as “. . . not just language, and surely not just grammar, but saying (writing)–doing–being–valuing–believing combinations” (151). Through Gee’s theory we can see that human expressions and comprehension outcomes are shaped by Discourses. This is encouraging for indigenous peoples interested in developing practices of digital media that respond to their respective cultures.

The decision to bridge print technology and digital media by NLS and *New Literacies Studies* evolved from an earlier movement known as the New London Group. Its cohort of thinkers began to consider multimodality and digital media as giving rise to new forms of literacy (Gee, “New Literacy Studies” 371-372). They argued that people use digital literacy like they use literacy to create meaning within communities of practice. In other words meanings derive from " . . . contexts of use within practices connected with social and cultural groups" (372). The New Literacies Studies extension to digital media and technology as a literary practice suggests that it can be thought of as an upgrade to the traditional notion of literacy as just reading and writing.

In the last few sections I have made the connections between literacy and digital literacy explicit. The reason for this is to provide us with tools so that, when we examine literacy, we are also able to gain insights to the potential of digital literacy, both in terms of what indigenous peoples might want to avoid and what might be worth leveraging.

Let’s begin to put our tools to use through an indigenous critical examination of literacy.

Through the Lens of Tribal Critical Race Theory

In this section I review a “Tribal Critical Race Theory in Education,” which helps us understand ties between literacy and racism in education, and how they are used to advance colonization (Brayboy, “Tribal Critical Race Theory” 425-446). Again, the purpose of this is to underscore the potential outcomes of digital literacy for indigenous peoples within contexts of colonial power.

In an effort to understand a critical theory of race specific to how racism towards Native Americans plays out at the intersections of law and education, education

anthropologist Bryan Brayboy responds with what he refers to as “Tribal Critical Race Theory in Education,” also referred to as *TribalCrit* (425). Brayboy’s *TribalCrit* is connected to a legal tradition known as Critical Race Theory (CRT) that was originally developed by legal scholars to analyze how racism plays out in law, and how law itself constructs race (Crenshaw xxv). A feature of CRT uses storytelling to humanize law, and to challenge legal jurisprudence to move beyond an “analytical approach to identity” (Hernández-Truyol 883) to understand the multi-dimensionality of those whose narratives are silenced (Bell, “Power of Narrative” 315-348; Delgado).

During the 1990s, legal and education scholars also began to extend this work to examine racism embedded in education. This has been useful in revealing the struggles that people of color experience within schools. These struggles include issues related to academic performance, student accessibility to resources, segregation, and the affects of institutional racism on the psychological wellbeing of students. Schools are one of the epicenters of colonization, and therefore, are sites that indigenous peoples want to control. I argue that *TribalCrit* is useful to the assessment of literacy because it provides us with a perspective on how this technology is framed in schools.

To build a critical race theory that incorporates an indigenous perspective, Brayboy lists what he refers to as nine tenets that provide the theoretical groundwork for the establishment of *TribalCrit*. These tenets are foundational to what I have written in this paper. In addition to this, the ways in which I present my ideas also derive from *TribalCrit*. In “Toward a Tribal Critical Race Theory In Education,” Brayboy states these tenets:

1. Colonization is endemic to society.
2. U.S. policies toward Indigenous peoples are rooted in imperialism, White supremacy, and a desire for material gain.
3. Indigenous peoples occupy a liminal space that accounts for both the political and racialized natures of our identities.
4. Indigenous peoples have a desire to obtain and forge tribal sovereignty, tribal autonomy, self-determination, and self-identification.
5. The concepts of culture, knowledge, and power take on new meaning when examined through an Indigenous lens.
6. Governmental policies and educational policies toward Indigenous peoples are intimately linked around the problematic goal of assimilation.
7. Tribal philosophies, beliefs, customs, traditions, and visions for the future are central to understanding the lived realities of Indigenous peoples, but they also illustrate the differences and adaptability among individuals and groups.
8. Stories are not separate from theory; they make up theory and are, therefore, real and legitimate sources of data and ways of being.
9. Theory and practice are connected in deep and explicit ways such that scholars must work towards social change. (429-430)

These tenets respond to the role racism plays in advancing colonization. Here, the context for colonization is the superimposition of European-American culture by mainstream society through religion, science, markets, and imperial governments to control Native American Nations and assimilate Native Americans. According to *TribalCrit*, the goal of these institutions is to advance a western-centric view of civilization upon the ancestral homelands of indigenous peoples.

One of the methods used to advance the colonial project is racism. Colonial powers use racism to define the nature of indigenous peoples. They also employ institutional racism within religion, the academy, and federal agencies that function to undermine the political and cultural legitimacy of indigenous peoples (Battiste 3-5). Methods go well beyond processes of assimilation: institutional racism has been founded upon scientific methodologies including ethnographies, labels, and categorization.

Sciences such as biology, anthropology, and psychology are systematically used to superimpose western interpretations of indigenous culture that perpetuate indigenous stereotypes and control the nature of indigenous “authenticity” (L.T. Smith 58-65). Scientific outcomes fueled by Christianity have led to the justification of the following racist labels used to describe indigenous peoples: a.) primitive, b.) barbaric, and c.) savage (Alfred, “Sovereignty” 37; Battiste 5-6; Powell 396-405).

Through these dehumanizing labels, colonial powers have refused to recognize indigenous forms of pre-Columbian civilization while at the same time exploiting indigenous markets, structures of governance, and connected knowledge systems (L.T. Smith 58-64). In this paragraph I refer to history in order to highlight a process that continues to exist and evolve. This leads us to a reflective moment when perhaps one must ask: In what way does digital literacy function as an adaptation of literacy for purposes of colonization?

Highly influential cultural critiques like *Red Earth, White Lies* by Vine Deloria Jr. argue that mainstream scientific conclusions are reflections of western consciousness, which lead to inaccurate interpretations and representations of indigenous peoples, cultures, histories, and the natural biomes they inhabit (Deloria Jr., *Red Earth* 3-7; Deloria Jr., *Custer Died* 78-101; L.T. Smith 58-68). These critiques demonstrate the role research has played in the establishment of colonial power. They have also effectively led to the ongoing reformation of anthropology.

To address issues raised in cultural critiques of science, contemporary researchers are currently acknowledging research fallacies resulting from biased methodologies,

methods, and conclusions influenced by human assumptions, ideology, colonialism, history, religion, politics, and economy (Biolsi and Zimmerman; Fine 267-290; Grimshaw and Hart 227-230; Scott 373-374). Prior to this, it was assumed by researchers that they had the objective ability to represent and speak on behalf of other cultures.

New theories in cognitive science further complicate assumptions inherent in the scientific method by suggesting that emotion is tied to reasoning (LeDoux 303; Damasio *xi-xix*). The role of emotion in human reasoning has deep implications regarding the objectivity of science. This is because western ideology has claimed its authority by asserting the Cartesian philosophy that scientific observations can be made without the influence of emotional biases.

Rhetorical Imperialism in Public Education

As the U.S. was establishing nationhood, it began the project of assaulting indigenous culture with assimilation policies (Alfred, “Sovereignty” 37). Through this, literacy in education and religion was enforced to facilitate the acculturation of indigenous peoples to Euro-American civic and religious standards (Archibald, “Coyote’s Story” 77; L.T. Smith 64). Literacy in education and colonial-power-knowledge are at the heart of colonization (Barnhardt and Kawagley 8-20; Deloria Jr., “Knowing and Understanding” 41-46; Doxtater 618-629; Marker 102-109; Okakok 1-18). Extending the question posed in the previous section, I now ask: Will digital literacy also be used to assimilate indigenous peoples in today’s classrooms?

On any given school day, a student of color will experience institutional racism at school that will assault his or her identity. Linguists Scollon and Scollon show powerful

evidence from research in Athabaskan communities of Alaska and northern Canada suggesting that students from oral cultures may have to change their identities in order to acquire literacy (Gee, “The New Literacy Studies” 374-376). Scollon and Scollon argue that “... the acquisition of this sort of literacy is not simply a matter of learning a new technology, it involves complicity with values, social practices, and ways of knowing that conflict with those of the Athabaskans” (375). With the evidence provided by Scollon and Scollon, let’s reflect on the following rhetorical question. Given that digital literacy extends literacy, is it possible that a person may be required to shift his or her identity to interact with digital media and computational hardware if the designs of these technologies are grounded in a foreign Discourse? I argue that the answer is yes, and I propose a solution to this problem in the concluding section of this paper.

The lack of diverse way of learning in schooling refuses to take the research of Scollon and Scollon into account in order to diversify its curricula. Here is an example of the consequences of this. In this scenario, a grade school student is using English to tell a story in front of the class when her story is publically rejected by the teacher (Gee, *Social Linguistics* 127-146). She is marginalized because her expression of African-American vernacular English is not valued in school. In this case her story is not accepted as the “proper way to speak English in school.” Social Linguistics author James Paul Gee analyzes the girl’s story to point out that her vernacular and method for structuring ideas is as sophisticated as a poet’s use of language, and is consistent with the oral traditions of her heritage (127-146). He then goes on to question why there is no aspect of schooling that recognizes and legitimizes her unique cultural voice.

This example supports the claims of many indigenous scholars that languages and cultural knowledge systems are simply not recognized or valued in schools, and that learning in schools does not correlate with informal cultural learning (Battiste 2-32; Kawagley 85-89, 102-106). The current U.S. educational system leaves the ethnic minority student with no other recourse but to change his or her identity. The outcome of this leads to an ethnic minority student's resistance to schooling or to shift his/her identity. Either option leads to consequences where the student has to lose something. In addition to this, he or she has to deal with issues associated to feeling inferior either at home or at school; meanwhile parents respond by developing a lack of trust in the educational system. It's a triple bottom line outcome, but only of loss.

It may be unrealistic for the dominant culture to expect that peoples of color will change their identities. Education reforms must be able to remove these abusive burdens from students. A culturally responsive curriculum will enable indigenous students to draw stronger continuums between classroom activities and home life (Brayboy and Castagno 733). Until this happens ethnic minority students will continue to smell colonization in the classroom. Maybe this is a factor for why a large percentage of these students perform poorly in schools. For those who do well, the effects of this become so powerful that cultural hegemony⁵¹ is perpetuated, in which case the oppressed sometimes choose to forget where they came from. To explain what I mean, I will share a story that involves digital literacy, education, and hegemony.

⁵¹ *Cultural Hegemony is a theory by the philosopher Antonio Gramsci. Hegemony is a Marxist theory that a dominant worldview becomes normalized in a multi-cultural society. This worldview originates from those at the top of the socio-economic hierarchy.*

This story begins with a talk I was invited to give to over 300 Latina/o high school students with aspirations to go to college, the majority of whom were Mexican Americans and Mexican Immigrants who had assembled on the day that Arizona anti-immigration bill SB1070 was scheduled to go into effect. This is a bill with portions of its legislation that have been blocked by the U.S. Supreme Court. Despite this, other parts of the legislation were permitted, which undoubtedly reduced the number of undocumented immigrants who live in Arizona. At the time the bill was made a legal reality, there was a great deal of fear, pain, confusion, and anger for Latina/o people born in the U.S., Latina/o immigrants naturalized as U.S. citizens, Latinas/os with work visas, and undocumented immigrants. All of these feelings were within me as I drove out to the event to meet youth who were looking for answers.

Upon stepping to the podium, I looked upon the young Latinos and Latinas, and decided to take a survey. After making them comfortable with the idea of interacting with me in this public scenario, I began to ask them questions designed to lead us toward some consensus regarding a simple theory of digital media. During this call and response exercise, I was blown away by their knowledge of the topic. In my ignorance I was under the impression that many of them were victims of the digital divide. In an effort to educate myself, I began to ask them many more questions.

I said, "How many of you came to our gathering today with a cell phone in your pocket?" The overwhelming majority of these students raised their hands. I then sought to ask more questions. "Okay," I said. "How many of you know how to text?" All hands went up. "Email?" All hands went up. "So you all have email accounts and access to the

internet?” They all nodded yes! Hmmm, I thought to myself. Wow, these kids use tech. Then I thought, But lets see how tech savvy they are. So I asked, “How many of you use Facebook?” They all raised their hands!!! With each answer I shared with them my surprise and my pride.

By this point I was convinced that these young men and women were quite comfortable using digital media. So now I began to wonder: Are they digitally literate? To find out, I asked them, “How many of you consider yourselves to be consumers of the media?” They all raised their hands. Then I asked, “In what ways do you consume digital media?” They shouted out lots of different ways they consume media, all of them linked to popular culture. Then I asked another question — this is where things begin to take a different turn. “How many of you,” I said, “consider yourselves creators or broadcasters of the media?” Their faces went blank. Only a few hands went up. This time I wasn’t surprised, and I responded to them with, “You mean to tell me that if I log onto your Facebook pages, I am going to find them blank?” Feeling as if I was heckling them, they all begin to boo at me. “No!” they shouted out, playfully sarcastic. So I playfully reciprocated: “Oh! Then you are broadcasters after all!” Upon hearing this, their faces lit up, and they all nodded affirmingly.

At this point I was able to ascertain that these kids engage digital media in order to contribute to popular culture. But I wondered if they used digital media to transform their political realities: Do they perform online or Internet activism? What I learned was that they were not using Facebook or any other application of digital media to express their thoughts about proposition SB1070. From my time with these Latina/o youth I came

to the conclusion that they had some digital literacy skills, but lacked the ability to infer their own meanings to interpret digital media. I also learned they did not use it to exercise social critique, and like most people they also lacked basic computer science skills. As a result, their ability to exercise their self-determination through digital media was very limited. From this experience, I realized that there is work that needs to be done to address this — which again was not a surprise to me.

I have cited moments where I was surprised and also moments where I wasn't. To finish asking them ten thousand questions, I decided to get a sense of the ratio between their knowledge of digital media and of their culture, so I asked them, "How many of you know about La Piedra del Sol?" Nothing could have prepared me for the outcome. Out of over 300 students, maybe only 8 of them raised their hands. I couldn't believe it! So I rephrased the question. I said, "It's also known as the Aztec Calendar Stone, and it was influenced by the Mayan calendar. Does anyone else know what this is?" This time maybe 15 students out of 300 students raised their hands. Stubborn, I then began to describe its stone-carved features, and I heard a few more in the crowd realize what I was talking about. But when I took another poll, only around 30 out of over 300 youth claimed to know of it.

When the students were confronted with the opportunity to express their thoughts regarding SB1070, they seemed confused, and they were wounded. In their minds they were U.S. Americans just like anybody else (even those who were undocumented). In their expressions, they were dying for the opportunity to prove it to all the non-believers (in their naivety they had not learned that the issue was not whether or not they could be

productive members of U.S. society, but one where they were being shut out due in large part to imperialism and racism embodied within U.S. and Mexican nationalism). On this day they were desperate to have the chance to prove to the gringos that they had what it takes to be successful in the U.S.! It was clear they knew they were Latina/os, but in my mind it appeared as if they were forgetting where they came from... They could not remember Aztlán... They wanted to be respected and relevant, and they sought to do this in hopes of pursuing the American Dream; they wanted to assume the normative values of the American status quo. As they were doing this, it seemed they were forgetting where they came from.

By turning our attention to the cultures from which indigenous students come, we must ask: How can a people continue to survive, to maintain their knowledge, wisdom, language, and identity, if its youth don't remember where they came from? How can we expect a people to fight for their human rights and political legitimacy if they cannot connect their circumstances to history? At the same time we cannot ignore the power of social media in the hands of our youth. The issues illustrated by my story suggest the importance of developing pedagogical strategies for indigenous youth that encourage their further development of digital literacies. However, as the story suggests, this is certainly important, but to do this alone is not enough. Digital media learning for indigenous communities must also include forms of learning that challenge students to consider ethical, useful, and meaningful expressions of these literacies within the frameworks of their respective cultures. Indigenous pedagogies of digital literacies can form feedback loops between digital media and indigenous knowledge systems that

propagate the learning of both at the same time. The emergence of diverse indigenous forms of digital literacy is critical for indigenous self-determination in a digital age.

The nation state will continue to insist on a monoculture to advance colonization for as long as possible. Education theorist and revolutionary Paulo Freire cites that schooling has very little to do with education, and that instead it acts as an exclusive banking system (Freire 78-81). In this system those who are in power simply use public education to invest dominant cultural values into the minds of students. This methodology of schooling is made explicit by governmental policy to use education to assimilate indigenous peoples (Brayboy, “Tribal Critical Race Theory”). This has had devastating effects on the vitality of cultures, knowledge systems that took thousands of years to construct, intergenerational connections, language diversity, and the overall wellbeing of society. Today aspects of formal education continue to diminish our diverse human potential.

The affects of formal education likely contributed to a very confusing situation for the youth in my story. A situation where pop culture inspired them with the coveted American value to consume, while schooling acculturated them to take on an American identity, only to have the State of Arizona turn around and reject them as “others,” and criminalize/dehumanize them as “illegals.”

Chicano Rasquache and Native American Re-imagined Ceremony

There are two ideas that exist in CRT that underline the permanence of racism in our world. One idea is that racism is driven by material, an idea also known as material racism (Bonilla-Silva 465-480). What this means is that racism is a method for control

that has the power to deny access to material for some people, while privileging access to others. Material racism rejects the idea that racism is an irrational psychological problem, but instead situates it as something rational in relation to market systems.

Racism is a way society determines the positions people get slotted into within hierarchical socio-economic structures (Bonilla-Silva 465-480; Haney Lopez 163-175; Smedly and Smedly 22-24). In the context of the U.S., I argue that this is a byproduct of capitalism. By thinking about it this way, it becomes hard to imagine that racism will go away as long as society is structured as an inequitable meritocracy. A critical theory on race that suggests the permanence of racism is called racial realism (Bell, “Racial Realism” 363-379). This theory asserts racism will always be among us. Legal critical race scholar, Derrick Bell, proposes that “Continued struggle [*in the fight for racial justice*] can bring about unexpected benefits and gains that in themselves justify continued endeavor” (378). Despite Bell’s argument that racism will not go away, he states, “The fight [for racial justice] in itself has meaning and should give us hope for the future” (378).

Like racism, literacy is another feature of society linked to our socio-economic structure. Similar to Bell’s assessment of racism, I argue that literacy will also not go away. A world mediated by literacy and digital literacy is here to stay. To eliminate it would require a revolution of epic proportions, with dangerous consequences in a global infrastructure that has become dependent on these technologies. Aside from these consequences, Bell’s proposal and wisdom are important to consider when thinking about literacy. In addition to matters of the law, we must also fight to address the issues

associated to literacy; this struggle can also “bring about unexpected benefits and gains” that can lead to greater equity in society. I believe this is what inspires indigenous writers to have the courage to move forward regardless of the dilemmas they face.

Despite digital literacy’s lineage to literacy as a colonizer tool, in a Fall 2011 course lecture, James Paul Gee states that previously unlikely members of society are now able to proliferate institutions where accessibility has been exclusive to certain people (unlike print media, digital media makes it difficult for central powers to control real-time and globally interconnected social activity, this is a major distinguishing property that sets digital literacy as an upgrade to literacy). Previously unlikely people are now gaining the opportunity to make contributions to society in ways that undermine the need for professional credentials or institutional language.

In his lecture, Gee cites several examples of “amateur” scientists and designers who are using digital media to proliferate professional institutions, as well as have societal impact. One example that he highlights is a group of young people who used a video game to solve a protein problem that advances HIV research. He argues that this is a situation where a group of kids who both lack credentials and specialized scientific language have achieved a scientific discovery worthy of the Nobel Prize. He states that this is good news for those who wish to proliferate, while it is bad news for the professionals who wish to remain relevant according to his/her credentials.

Proliferation has always been a goal of indigenous peoples as a way to resist colonization. Indigenous peoples have sought to proliferate western founded systems of law, formal education, literacy, cultural artifacts, etc. with indigenous actions. Part of

surviving colonization has been about finding ways to hack colonizer systems and tools to avoid assimilation, while creating new gateways for self-determination. Accessibility created by indigenous peoples has always provided innovative and culturally emergent outcomes. An example of this is a Chicano cultural practice known as rasquachismo. Rasquache practices provide frameworks for innovation, creativity, and aesthetics.

Rasquachismo is a folkloric practice and indigenous knowledge that demonstrates the adaptive reuse of foreign artifacts along with the resourceful application of discarded materials through designs based on creative improvisation (Ybarra-Frausto 128-150). These designs are functional and possess culturally responsive semiotic and aesthetic values. The rasquache creation of tools demonstrates innovation, critique, learning, and self-determination. It's a way to take a game for example, and modify it so that it now serves a different purpose, one that responds to those who modified it.

For example, think about the lowrider — but not like lowrider magazine, or a pinche⁵² cop or commuter! Think about it as metaphor for a perception of time. This mod⁵³ changes the rules of the road, the behavior of traffic, and a sense of place: *Slow down, vato*⁵⁴, it says. *Don't be in such a hurry. Be safe, take it easy, and enjoy life.* Think about the murals painted on a lowrider's hoods, doors, and fenders; these are ways of remembering and or building public memory. A lowrider is a mobile jukebox of Chicano musical jams about life on the borderlands. Another way to conceptualize a lowrider is to think of this innovation as a story that helps mediate the social networks that maintain

⁵² Chicana/o slang for the words: damn, darn, fucking.

⁵³ Slang for the word: modification.

⁵⁴ Chicana/o slang for the word: man. In some Chicano communities the word is pronounced “vato” or “bato.” You can also replace this term with the word “chica,” which is slang for the word: woman.

Chicano Discourse. Think about a family building a lowrider together: uncles, aunties, abuelas, abuelos, neighbors, moms and dads teaching kids (brothers, sisters, and cousins) about engineering, art, culture, style, heritage, humor, love, and respect. Building a lowrider is a “re-imagined ceremony” that transforms contemporary place and time. It is the transformation of a car, a ubiquitous non-place in America, into sacred time/space. It neutralizes the commodification of time and exercising a degree of control over the dromosphere (Virilio, *Speed and Politics*).

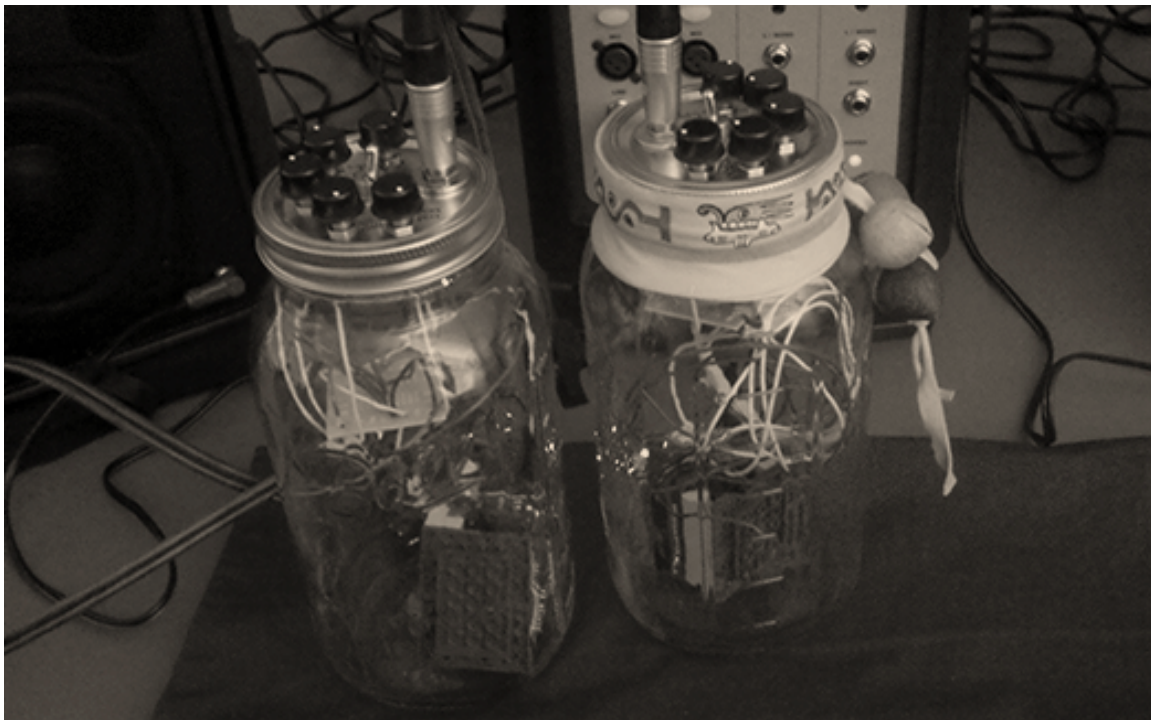


Figure 2: Musical instrument jars plugged into amp, by *Radio Healer*

The photo above demonstrates an example of technology that has been innovated through Rasquachismo. These objects are two electronic musical synthesizers that have been built using glass canning jars, Lego building blocks, goat hide, ayoyote shells, and homemade circuits. These jars produce drones of sound that are used as part of an indigenous storytelling performance.

Similar to rasquachismo, the Native American writer Craig Womack sought to do some modding of his own: he modified the literary game in order to create a place for

Native American writers in the American cannon of writing (15-16). Womack responded out of a need to hack a system built upon incorrect assumptions in the academy that literacy affects people in a universal way. Prior to his mod, the literary canon did not have the ability to recognize his or the work of his Native American contemporaries.

To remedy the situation, Womack calls upon Native Americans to create new cultural practices around literacy (12, 15-16). This includes the development of indigenous frameworks for the analysis and evaluation of indigenous literacy, as well as indigenous methods that Native Americans can use to critique their own cultures. This is an idea extended by First Nations scholar, Shawn Wilson, who wrote a book titled *Research is Ceremony*, which introduces indigenous research methods that modify what Linda T. Smith implies as colonizing methodologies (L.T. Smith; Wilson).

In addition to communities of practice and methods, Womack goes one step further to reach a meta-approach to literacy. He does this by encouraging indigenous peoples to consider “innovation on tradition” (12). By using this framework, he hacks into literacy and modifies it so that it becomes part of indigenous knowledge systems. His hack suggests a protocol that calls for indigenous peoples to approach literacy as it were a form of oral tradition. He then proceeds to give examples of what this can look like. In keeping consistent with the arguments made throughout this paper, I believe that Womack’s idea for literacy can be scaled over to digital literacy.

In this paper I have highlighted a way that digital literacy extends literacy. I have also provided NLS and *tribalCrit* contexts by which to make explicit my concerns and perspectives about literacy. I have done this based upon my Discourse as a mestizo

person, a digital media scholar, an artist, a cultural worker, rhetorician, and an intermedia practitioner. The context and issues associated to literacy form the foundation from which I respond by considering ways that digital literacy can be made to serve the self-determination of indigenous peoples. I have argued that this is possible if digital literacy is appropriated, innovated upon through indigenous knowledge systems, and repositioned within cultural practices.

If we refer back to the lowrider as another metaphor, we can see the potential for indigenous peoples to create and drive digital media expressions on the information superhighway. Digital media is creating current shifts in power where the consumer is now also the producer (Jenkins). This convergent phenomenon is causing a shift in media power that can be used to exert indigenous self-determination over law, economics, politics, education, and aesthetics (Jenkins and Deuze 7). The time has never been more favorable for this to occur.

Essay 3.4 – Values In the Medium

*<ghostInTheShell> values are in the medium
<cyberShaman> the medium is the sovereignty
<ghostInTheShell> yes, indeed it is.*

In this essay I argue that, for the purposes of indigenous technological sovereignty⁵⁵ within a context of pervasive media and global market systems, it is of central importance for indigenous populations to use traditional frameworks to form a code of ethics for (a.) building digital literacies capacities, (b.) the culturally responsive design, fabrication, and use of technologies, and (c.) critical engagement with ubiquitous digital media.

To support my claims, I provide an extension of Marshall McLuhan's, "The Medium is the Message [Message]" with an indigenous theory of the medium and a practical example of this indigenous theory (McLuhan & Fiore). Implicit within McLuhan's Western canonical theory is the idea that mediums,⁵⁶ or tools used to generate and broadcast media, are more influential than media content⁵⁷ (8). In this essay I theorize that the powerful influences of mediums derive from the morals, ethics, and values that are encoded into technologies through ideation, fabrication, and use.

The purpose of extending McLuhan's theory is to develop the assertion for why the indigenous value-laden transformation of pervasive and networked digital/electronic tools is foundational to Tecno-Sovereignty. In Tecno-Sovereignty, I describe this

⁵⁵ *Tecno-Sovereignty* is the indigenous appropriation and transformation of digital electronic/technology for the exercise of indigenous self-determinism.

⁵⁶ In this paper I also refer to mediums as tools or implements. This is different from media, which is content, messages, or information (For a redundant definition of media, see the next footnote).

⁵⁷ In this paper I also refer to content as media, messages, or information.

transformation as occurring through indigenous appropriations of digital/electronic technology expressed through design outcomes that are based on adaptive reuse, recycling, modding⁵⁸, hacking, and use adaptations. In this essay I also maintain that it is essential to indigenous self-determination to produce and use these re-imagined tools in accordance with indigenous traditional ethics of technology. To support this claim, I refer to a specific site of Native American memory, traditions, and tools.

Pervasive Media and A Sense of Urgency

The global pervasive reality of digital/electronic technology is generating waves of digital media that are rapidly changing the world. According to McLuhan, electronic information is more influential to a child than his or her own parents (McLuhan and Fiore 14). He describes its power to influence our youth (and adults alike) by arguing that the presence of electronically mediated information in our homes is like adding additional members to the family. McLuhan suggests that pervasive media has profound influences on all peoples who have adopted digital/electronic technology into their lives. Implicit in his theories is that the profound influence of the media is not only associated with today's technology, but that this has been happening throughout modern history since the use of "old media" such as print, radio, and television (81).

McLuhan also predicts in *The Medium is the Massage* that the influential power of mediums will increase as the capabilities of electronic technology advance (26,63). As the speed and ubiquity of mediums advance as pervasive networks, so will their

⁵⁸ Modding is a pop-culture slang term for the word modification. It describes the practice of modifying a tool or a game so that its functionality changes to perform in a way that is different from what it was originally intended.

invisibility, as well as the invisibility of time-space (McLuhan and Fiore 63-65, 84-85; Hopkins, “If History Moves at the Speed of its Weapons;” 109-140; Postcommodity, *If History Moves at the Speed of its Weapons, Then the Shape of the Arrow Is Changing*; Virilio, *Speed and Politics* 47, 61-62, 84-86, 149-167). As the speed, ubiquity, and invisibility of mediums and media advance, the influential power of mediums and media to persuade and pervade societal perceptions and thought will increase, as will: surveillance; the potential for destruction through war or human error; a reliance on decision-making computation or automation; and ubiquitous mechanisms for control (McLuhan and Fiore, 12, 16, 24, 26, 41; Virilio, *Speed and Politics* 39-40, 51-54, 84-86, 149-167, Virilio, *War and Cinema* 1-5). By applying a “Tribal critical race theory of Indian education” as a lens for viewing digital technological advancements, the origins, aggressive deployment, and increasing capabilities of this ubiquitous medium and media underscore its potential to colonize indigenous peoples (Brayboy, “Toward a Tribal Critical Race Theory”). If this claim is an oversimplified assertion of tribal critical race theory, then I argue that, at the very least, it provokes a warranted inquiry of the colonizing potential of digital media.

Tecno-Sovereignty responds to this call for inquiry with a discourse of indigenous self-determination in a digital age. Theories of Tecno-Sovereignty are predicated upon emerging pervasive media’s capacities to extend nearly every individual’s ability to globally receive, generate, and transmit media instantaneously across space and time. Tecno-Sovereignty illustrates that diverse indigenous peoples throughout the world have the opportunity to appropriate and re-form this advancing media to exercise their self-

determination. This theory is consistent with contemporary media scholars Henry Jenkins and Mark Deuze who claim that, in addition to reception, the production and distribution of media by citizen collectives, causes power to shift toward their side (Jenkins & Deuze 5-12). This political possibility is also available to indigenous peoples.

According to cyber-law expert Lawrence Lessig, architectures — media included — embed certain values while also occluding other values. Values, which both produce and negate power, are encoded into architectures by architects or writers of code. Architects of cyberspace embed their values accordingly with the political decisions they make concerning design (Lessig, *Code Version 2.0* 77-79, 110, 114, 317). Lessig argues that those who write code are lawmakers who determine the nature of the Internet and its sovereignty. When values determine the law, they, in turn, encode power over bodies and lands (Lessig, *Code Version 2.0* 79; Lessig, *Code and Other Laws* 221; Bratton 7-9).

For expressions of indigenous Tecno-Sovereignty to emerge and flourish in a time of emergent ubiquitous media, indigenous digital literacy pedagogies for formal/informal learning will need to be established. The capacity to accomplish this depends upon the implementation of new education initiatives that support cross-cultural, inter-cultural, and co-intentional partnerships for culturally responsive digital media and learning (Kafai et al., “Ethnocomputing”). For this proposal to reflect self-determination, these partnerships must ensure that digital literacies capacity building is situated within indigenous pedagogical frameworks whose designs are led by and/or co-intentionally designed with indigenous peoples. This is the only way to ensure that curricula are aimed towards supporting localized culturally responsive learning for indigenous youth.

To demonstrate the growing power mediums and media as a colonizing force, I will highlight some of the disconcerting issues connected to its use. Despite the risk of digressing too far, I believe that an awareness of technological advancements and the issues associated with how this power is used can help define key issues related to building digital literacies capacities for indigenous technological sovereignty.

We are currently in a new era of electronic media where it exists as a vast dynamic system of high velocity information that has transformed human relationships with time, space, communication, experiences, as well as the nature of human relationships themselves. According to McLuhan, we live in a time when Western scientific practices are using digital computation to extract features or patterns from vast amounts of information (McLuhan and Fiore 63). These technologies are developed to respond to the vast landscapes of information being collected and archived every moment of every day.

The only way for humans to make sense of these massive landscapes of information is to use ultra-fast feature extraction and machine learning technologies to create meaning. In fact, every time you use an Internet search engine to look for information or surf the Internet, you are employing some of these feature extraction technologies. At the same time as you use these technologies, other feature extraction algorithms controlled by individuals, non-profits, governments, collectives, and corporations are being used to reciprocally survey your activities.

Both the epic accumulation and feature extraction of information happen via digital/electronic mediums. These processes of surveillance and meaning making

generate powers in the world that will mediate the creation of new cultures, the destruction of cultures, the unwanted transformation of some cultures, and the self-determined emergence of other cultures. Some peoples might find that they have little choice but to change, while others will emerge with intent as their mark of assent through expressions of self-determination (Lyons, *X-marks*).

The powerful catalysts of pervasive media are global-market systems fueled by neoliberal philosophies and the neoliberal fervor to engineer society and solve the ills of the world via a free market economy. The real-time efficiency and pervasive global advancement of today's corporate market systems could not exist without the high velocities of today's technology. My critique of global market systems, and their mediating Internet is that, despite "good intentions," these forces transfer and impose all their embedded morals, ethics, and values to every other culture they come in contact with⁵⁹. In all cases neoliberal forces, like NGOs or the sustainability industry, contradict themselves as they attempt to use economic mechanisms to mitigate disparities caused by the same economic mechanisms that cause disparities in the first place (Postcommodity, *Do You Remember When?*). Furthermore, for peoples who have experienced colonization, any imposition of the morals, ethics, and values encoded in neoliberal efforts can trigger public memories of imperial subjugation, which may represent sentiments of colonization associated with today's global market systems.

⁵⁹ These worldviews originated from colonization and imperial post-industrial nations.

A cutting extension of this critique can be found within the convolution media⁶⁰ art practices of the trans-disciplinary indigenous artist collective Postcommodity (*Postcommodity*, “About”). This indigenous group refers to the violent consequences of market liberalization in the following excerpt of their artist statement as “. . . assaultive manifestations of the global market . . .” According to its statement, the collective’s primary purpose, within the context of global market systems, is to critique “. . . supporting institutions, public perceptions, beliefs, and individual actions that comprise the ever-expanding, multinational, multiracial and multiethnic colonizing force that is defining the 21st Century through ever increasing velocities and complex forms of violence.” Implicit in this discourse is the idea that these “ever increasing velocities” directly correlate with the ever-increasing speeds of digital media and networked communications technologies, and that these velocities carry with them values that encode colonization (*Postcommodity*, “About”).

Postcommodity is an interesting group to reference here because they are both an indigenous group of artists who all come from diverse indigenous peoples destabilized by colonization in the United States, and through an indigenous lens they hypothesize the violence and colonization associated with global market systems, such as the imperial export of technologies by which indigenous peoples are excluded from ideation processes. This indigenous artist collective is also a group of digital/electronic technology savvy artist-hackers who appropriate, hack, re-imagine, and re-position the same tools

⁶⁰ Indigenous convolution media is the site where new emerging digital media/technology, old electronic media/technology, and indigenous traditional ceremonial media are all brought together by indigenous designer-users in order to create culturally sensible innovations that operationalize indigenous sovereignty, which are emancipatory outcomes responding to the needs and desires of a given community.

used by the forces they critique in order to exercise their own collective self-determination through practices of indigenous story-work via constructions of visual, sonic, and experiential metaphors (Archibald, *Indigenous Storywork* 5-33).

Through their art, they use their transdisciplinary literacies capacities to deploy disruptive yet productive indigenous digital/electronic innovations. These disruptive innovations generate and broadcast indigenous stories, metaphors, and semiotic vehicles that intentionally complicate public discourse. This is a working example of an indigenous group enacting self-determination from within colonial structures of erasure. Through their actions, Postcommodity successfully flips the script by proliferating non-indigenous institutions⁶¹ throughout the world with indigenous counter-narratives that serve to complicate and de-center normative views of technology, velocity, markets, weapons/warfare, and globalization.

In the art discourse of Postcommodity, the collective offers a critique of the market by demonstrating, through art, the many ways indigenous peoples are destabilized by a range of actions associated to neoliberal global market systems and the multinational oligarchy they support. The following are a few examples of how indigenous peoples are destabilized by today's liberalized global market systems:

- The displacement of indigenous peoples by unsustainable yet heavily armed nations who use weapons and legal constructions to control land and natural resources (Alfred, "Sovereignty" 48; Alfred, Wasáse 19-38).

⁶¹ Here I am referring to institutions that are not supported or founded by an indigenous population or populations. To further clarify, I am referring to institutions that do not embody indigenous discourses within their institutional memories, and are historically implicated in the colonization of indigenous peoples.

- The creation of oppression by colonizing colonial forces that use educational systems to undermine local culture and history (Freire, 71-86; Lyons, “Rhetorical Sovereignty” 448-449).
- The imperial non-place market-based popular-culture models of living powered by individualism and materialism (Adorno & Horkheimer).
- The genetic modification and patenting of seeds indigenous peoples have been the stewards of for thousands of years (Harry and Kanehe 30-35).
- The patenting of indigenous knowledge, and the simulation of an imagined indigenous past to control representations of indigenous peoples, and to generate commodities for tourism (Harry and Kanehe 27-55).
- The neoliberal paternalism under the guise of “help” that comes with covert agendas to install market infrastructures for national developments which threaten to replace indigenous worldviews with dominant worldviews (political, economical, religious, aesthetics, etc.)

These examples are not indictments of capitalism itself, but of the violent byproducts of capitalism that are in some cases emergent of the accelerating and high velocity corporate production of goods and services, also known as new or fast capitalism.

An example of violence capitalism includes expansion through socio-culturally articulated mass consumption, which induces the collapse of local sustainable economies through imported industrialization, financial debts, and the extreme exploitation of local labor at low wages (Marazzi 44, 117-118). Other examples include: the mass consumption of environmentally unfriendly products designed with embedded

obsolescence; the corporate creation of market valor via free citizen labor with no monetary benefits to the consumer through the corporate exploitation of consumer desires related to creativity, relationships, emotions, and social acceptance; the local displacement of production and de-territorialized consumption provoking unaccountable relationships to the local environmental sustainability of lands; the creation of market valor by leveraging citizens as a 24/7 labor resource (requiring longer, more intense workdays) by invoking social-psychological identity cults based on corporate brands; the corporate competition at increasing velocities with no reflection towards the costs to humanity; the creation of global scarcities as a method for building monopolies; the corporate sponsored mass surveillance of consumer/laborers; the unregulated, unpredictable and unstable casino/speculative capitalism that provokes potentially dangerous international political tensions; and the casino/speculative capitalism under which those of lower socio-economic status lack the resources to protect themselves from bad luck (Gee, Hull, and Lankshear 27-48; Marazzi 44, 49-52, 54-55, 59-61, 115, 117-119; Sennett 139-140, 156-157; Strange 2-3, 96).

These are but a few of the examples of violence capitalism that indigenous peoples, particularly those surviving colonization, are viscerally all too aware of. Lastly, I would also like to highlight the most fundamentally oppressive example of all forms of violence capitalism survived by indigenous peoples, which is the colonization of lands through predatory market expansion that uses state sponsored military and corporate financial violence to either fabricate man-made disasters or political coups, or that takes

advantage of natural disasters in order to create new economic opportunities at devastating costs to developing nations and local indigenous inhabitants (Klein).

Violence capitalism has been known to: drive indigenous languages to extinction; create inter-generational disconnections between elders and youth; create local health disparities; sever deep spiritual connections facilitated through people's relationships to their local biomes; and empower the centralization of superpower governments and multinational corporate oligarchies that have proven capable of producing apocalyptic scenarios (Strange, 193). Furthermore, oligarchies have created social structures leading to inequities in the world where the wealthiest 1% of the global population will control 50% of the globe's wealth, thus creating a world where the few rich get richer while more people grow poorer (Cohen; Gee, Hull, and Lankshear 45-48; Strange 146-147).

Most of today's capitalism, whether violent or not, is facilitated through advancing electronic technologies. To respond to this technological reality and its ties to politics, culture, and society, I recommend that indigenous peoples consider the development of digital/electronic tools to claim their digital commons⁶².

Despite these aforementioned critiques of neoliberalism and the violent aspects of today's capitalism, for indigenous peoples there is nothing traditional or cultural about being in poverty, and there is nothing sovereign about allowing oneself to be victimized by the aforementioned violence (Miller 4-6, 115-116). At the same time, capitalism can be used for good, which is something that is not mentioned above. While there is nothing inherently violent about capitalism, unfortunately we humans have chosen to construct

⁶² In this paper I define digital commons as a group's developed consciousness about digital/electronic technology based on their respective way of being and knowing.

and enact it that way. For indigenous peoples, a good use of capitalism is to: build sovereignty that is just in accordance with indigenous ethics; increase indigenous political capacities; sustain indigenous languages and traditions; and to culturally emerge with increases in indigenous health and longevity (157-164). The problem is that for many indigenous communities, such as those whose borders exist beyond powerful economic engines like the United States, this idea is not so easily attainable because many indigenous peoples in developing countries are entrenched in corporate engineered systems of debt, consumption, and low wage labor (Gee, Hull, and Lanksheer 44-48, Marazzi 30, 44, 117-118). In these cases, global indigenous political and economic alliances must be assembled for the purposes of sovereignty.

To achieve sovereignty, indigenous peoples have a responsibility to repatriate their wealth through their own self-determined market systems, which means they will, despite its violence, most likely have to carefully interface with the global marketplace in ways that are self-determined. Perhaps visions of indigenous sovereignty might help contribute systems that demonstrate equitable and non-violent forms of capitalism.

This argument of indigenous capitalism is explicated in the work of Robert J. Miller who wrote *Reservation "Capitalism": Economic Development in Indian Country*. In his book, Miller reminds us that capitalism, for example, is also the heritage of the indigenous peoples of the Americas, who once owned, controlled, and managed 100% of the Western Hemisphere's lands and natural resources, which were used to support economic systems that were networked throughout the hemisphere with expansive indigenous entrepreneurial systems facilitated through currency and trade (Miller 1).

Today, in the United States, colonial forces have stolen 99% of these assets over the course of a little more than 500 years (1). Colonial settlers, through military and financial violence, as well as broken treaties, stripped Native Americans of their lands and their associated resources. Even though Native Americans have reservations, according to some interpretations of the trust doctrine between the United States federal government and Native American Nations, these lands and their associated resources are legally/paternally held in trust by the federal government on behalf of and in the “best interests” of Native American nations (25-47; Wilkins and Lomawaima 70).

Early on, the colonial actions that depleted Native Americans of their lands, political structures, languages and cultures, economic systems, and natural resources occurred within the context of European imported disease epidemics, making the conditions for colonization favorable to those coming to the Western Hemisphere from abroad (29-30). Today the relationship between the U.S. federal government and Native American nations has entered the era of self-determination, where indigenous peoples have the ability to leverage federal funds to support their own self-determined programs designed to provide Native citizen benefits and to support indigenous sovereignty (47).

Prior to first contact, indigenous networked economies and civilizations thrived throughout the Western Hemisphere as its populations worked hard to sustain themselves. Miller provides evidence demonstrating that prior to colonization, “. . . native peoples understood, appreciated, and lived by principles that we today call private property rights, entrepreneurship, and free market economics . . . (11)” He clarifies that these principles were contextualized by contested territories, land and resource management, cities, road

systems, and extremely complex political systems, all of which, like systems of today, had their ups and downs (11-24).

Miller argues that it is crucial to the survival and dignity of Native Americans in the United States to repatriate their economic systems destroyed by colonization. By repatriation, Miller is not suggesting that indigenous peoples rebuild the systems of the past, but is instead recommending that indigenous peoples construct new economic systems responsive toward today's contexts, but in the spirit of their ancestral free market capitalism, which had effective protocols for mitigating greed — something, evidenced by the aforementioned violence, that is missing in today's global capitalism (160-164).

According to Miller, within historical frameworks of North American indigenous capitalism, those who had an excess of wealth were responsible for paying for community ceremonies and feasts, potlatches, and helping the less fortunate (17-18, 162). The mechanism for continuing this cultural tradition remains a feature of tribal governments. Many of these traditions also exist within the culture of new capitalism. However, they are not used as an economic mechanism to mitigate greed, but instead are exercised as charity, which is prescribed and encouraged by Christianity and motivated by missionary doctrines, as well as for the accumulation of social collateral. While charity is considered a social good and does help to distribute wealth, its primary purpose is not to prevent, for example, a corporate oligarchy from forming.

The devastating aftereffects of colonization and the colonial destruction of indigenous economic systems highlight the importance of Miller's arguments. The legacy of colonization, which includes poverty, continues to negatively impact the cultures,

health, and wellness of Native Americans. A crucial refrain by tribal leaders quoted by Miller, as well as by indigenous sovereignty scholars, is that sovereignty requires investments, and some of these include investments such as citizen labor, self-determined rhetorics of public engagement, and traditional cultural practices (i.e. ceremony, arts, language etc.), while other investments are financial and monetary. In the case of the latter, economic development is an important tool by which to help operationalize indigenous sovereignty (4-6, 115-116). While the former represent community obligations, Miller argues that economic development can help offset some of the costs associated with citizen labor, self-determined rhetorics of public engagement, and traditional cultural practices (161). In other words, it takes money to, for example, build robust programs that will preserve Native American languages.

The purpose for articulating capitalism's importance for indigenous sovereignty in this research is because, in relation to many things such as culture, rhetorics, politics, literacies, land management, etc., economics is an important and unavoidable aspect of Tecno-Sovereignty. This inextricable tie of indigenous economics and their implications to Tecno-Sovereignty become clear in the second half of this essay. This is because the medium is itself an instantiation of cultural, rhetorical, and economic sovereignty. The mediums replicate their sovereignty because, in addition to being an instantiations of sovereignty onto themselves, they also manifest as tools for recursively operationalizing cultural, rhetorical, and economic sovereignty.

An Indigenous Theory of the Medium

In the second half of this paper, I will dialogue with Marshall McLuhan's theory, "The Medium is the Message [Message]." As I stated at the beginning of this essay, McLuhan argues that the medium is more influential than content; in other words, the tools (the mediums) used to generate and broadcast media are more influential than the media (content/message) itself. To extend McLuhan's theory, I offer the additional theory that the co-intentional marketplace worldviews of producers and consumers are encoded by the designs of these manufactured technologies. This is because ethics, morals, and values that govern behaviors are encoded by designs (Kozinets).

I am suggesting through this theory that the design and functions of pervasive technologies are grounded by corporate assumptions that yield the frameworks for which tools are constructed, the ways that tools are constructed, the relationships humans have with tools, the ways tools are used, and the purposes tools are used for. New Literacies Studies suggests that tools⁶³ or technologies give rise to new literacies (Gee, "Discourse" 371-372). In this field, linguistics scholar James Paul Gee highlights evidence such as the research of Scollon and Scollon that support the claim that tools (in the case of their research, reading and writing) may require a user of an exogenous technology to become complicit with values and practices associated to the culture from this given technology is grounded⁶⁴ (Gee, "Discourse" 374-376). This evidence correlates with McLuhan's theory regarding how influential tools, like the alphabet, can be (McLuhan and Fiore 44).

⁶³ In this paper, I use the words "tools" and "technologies" interchangeably as synonyms.

⁶⁴ To complicate this conclusion by Scollon and Scollon, I am not arguing that it is necessarily wrong or inherently bad for people to incorporate discourses from outside one's primary Discourse. In fact according

Indigenous people's classical frameworks for tools are generally quite different from those we find embedded in the designs and popular uses of technologies by corporations. However, both tools by corporations and indigenous tools are both grounded by assumptions. To strengthen these arguments, I will contrast Western frameworks (which come from a dominant cultural worldview) with traditional indigenous frameworks regarding their inherent values about the design, construction, creation, and uses of tools. My analysis will also include respective indigenous philosophies about human-tool relationships and interaction.

My motive for illustrating the difference between Western and indigenous ideas about tools is to present the reasons why I recommend the indigenous re-imagined appropriation of digital/electronic tools through indigenous knowledge systems Discourses⁶⁵ as a core practice of Tecno-Sovereignty. Before I present these descriptions, I want to acknowledge that the following paragraphs illustrate simplified arguments about tools for the purposes of illustrating an early indigenous theory of the medium.

In the following paragraphs I will provide comparative descriptions regarding worldview approaches to tools by Western industrial and some Native American traditions. To do this I will present two games connected by history to illustrate two varying cultural approaches to a specific tool required for play. The games that I will refer to for this analysis are called Stickball and Lacrosse.

to Social Linguist, James Paul Gee, humans do this all the time, even within the framework of their cultures. I will argue however that this becomes problematic to indigenous self-determination and survivance when a secondary discourse subjugates a person to abandon his or her primary discourse.

⁶⁵ Social Linguist James Paul Gee describes “. . . Discourses with a capital ‘D’” as “. . . not just language, and surely not just grammar, but saying (writing)–doing–being–valuing–believing combinations” (Gee, *Social Linguistics* 151).

Stickball is a Native American game that was adapted by European settlers in America to form a sport popularly known as Lacrosse. The word Lacrosse originated from a French Canadian description of Native American games such as Stickball. This description is *jeu de la crosse* which, according to the Online Etymology Dictionary, means “game with hooked sticks.” This description later evolved into the word Lacrosse, as Native American games such as Stickball were modified with rules of play and adaptations meant to fit colonial epistemologies. Both Stickball and Lacrosse require players of the game to handle a tool referred to as a “stick.” Although both of these tools look very similar to each other, and would appear to share similar functions, we will soon see that in many ways these tools considerably differ from one other.

To get started I will provide a context in which the Lacrosse stick is designed. To understand the design motivations behind this stick, it is necessary to understand that its design emerges through models of industrial capitalism. In this context, a particular brand of stick is designed as a product meant to compete with other brands that are on the market. Corporations who make Lacrosse sticks all compete against each other to create sticks with levels of performance associated to cost. One of the consumer expectations for products on the market is: the higher the cost, the better the quality of the product.

In addition to creating the highest performing sticks based on cost, corporations also invest in design efforts to brand and customize their products, with the expectation that the brand and subtle design differences will increase corporate competitiveness in the market (Gee, Hull, and Lankshear 26, 43). Market branding has given rise to a phenomenon that at times defies the aforementioned consumer expectation, that cost is

proportional to quality. In some cases, products made of the same materials and relative design will end up selling for different costs. The way this plays out is that the product associated to a brand with the most socio-cultural status or caché is priced at the highest cost. Consumers will spend extra money on a product because it meets their desires to be perceived by other members of society as having higher socio-economic and socio-cultural status — a measure of their consumer sophistication (27, 43).

The irrational powers of materialism along with the individualist identity driven desires that arise from today's global markets are so influential that these markets have produced consumers who will pay more money for an inferior product just to be affiliated with its market brand. This is because market brands carry with them socio-cultural currencies co-constructed by designers who use market branding as their source of power, and by consumers exercising their spending power while seeking to use products as a way to construct their identities (26, 28, 43).

The primary reason a corporation produces Lacrosse sticks is to generate monetary profits. This means that the stick and its branding have to be designed so they can be efficiently manufactured at a scale to meet consumer demands. Design, branding, and manufacturing must yield a competitive cost that is going to allow the product to sell well against the market competition. Sports equipment corporations and their shareholders may or may not take pride in their sticks, and they may or may not care about Lacrosse, but they will always care about maximizing profits.

Because of the financial motivations of a corporation, Lacrosse sticks have to be designed to provide a player with a competitive edge, and/or provide the player with

status. If money is no object, these are two of the most important factors that determine why a player would choose one stick over another. However, remember how markets are critiqued by Postcommodity as a force that is destabilizing communities. Here is an example of how this critique comes into play with the Lacrosse stick. In the framework of Lacrosse, this tool is multipurpose. One purpose of the stick is to handle the ball in a game of Lacrosse according to the rules of play. Its other purpose is to function as part of an endless landscape of manufactured tools that work in concert with each other to construct society, including public memory and meaning.

The social constructions I refer to will privilege some groups over other groups. In the U.S., this leads to the development of a social hierarchy comprised of an ever growing binary of winners and losers. In the drama of a Lacrosse game, we can see that the team who can afford to pay for the most expensive sticks will have ideally invested in increased product performance that provides them with a winning advantage. Furthermore, the market branding of these sticks also ensures that this team will be the one perceived to have the highest socio-economic and socio-cultural status.

Now if we widen our discourse frame to include racism in the United States, and we look at the ways it interfaces with class status to construct social hierarchies of power, chances favor the possibility that a hypothetical team coming from a poor neighborhood primarily composed of people of color will end up being the underdogs to a predominantly white affluent team coming from the rich side of town (Bonilla-Silva 469-471). This doesn't mean that the underdogs won't upset the privileged team, but it might mean they are disadvantaged because economically dependent odds have been stacked

against them. If the underdogs have heart and pull off a win, their victory may still not increase popular support for the team because they can't afford to sport a premium brand! In this sense the winners still wind up as the losers because the brand trumps all as it prevails to reify a racialized social system where people of color are marginalized as low-paid service workers (Bonilla-Silva 469-470; Gee, Hull, and Lankshear 44-45).

I acknowledge that this story is hypothetical fiction, and that it may be viewed as biased rhetoric. My purpose in telling this fiction is to appeal to you, the reader, to reflect on the underlying morals of the story, and how what may seem to be an overly dramatized story of Lacrosse and race becomes more of a consequential reality in high-stakes games such as the global-marketplace. To finish out here, I want to clarify that Lacrosse is often positioned as a class-conscious sport. In other words it's not within the figured-world of some privileged "gentlemen" for people in poverty to play Lacrosse. With this stated, let's now look at what's going on with the Stickball stick.

To review the design process for the Stickball stick it is important to understand that the designs of this tool emerge through the labor of indigenous ceremony (Cajete, *Spirit of the Game* 96-97, 104-105). In this context, the stick is designed, not as a market product for mass production/consumption, but rather as a tool to facilitate the Native American sacred ceremony of game. To provide you with more knowledge about what I am referring to here, I want to start out by offering a definition for the meaning of *sacred*.

Notions of the sacred have been written about many times by indigenous scholars. For the purposes of this paper I want to cite the work of Peggy V. Beck, Anna Lee Waters, and Nia Francisco, who have written extensively on this topic. In their book

titled *The Sacred: Ways of Knowledge, Sources and Life*, the word sacred is a way to describe “sources of life and ways of knowledge” (3). This is based on a North American indigenous worldview, which is different from notions of the sacred that are tied to religions (by institutions). Beck, Waters, and Francisco go on to clarify this with the following statements: “Classical tribal sacred ways do not try to explain or control all phenomena in the universe. They do not, as organizations, seek to dominate peoples’ thoughts or ways of personal worship. This is what makes these ways distinct — from “Schools” of philosophy in the history of ideas or “denominations” in the history of religion (4-5).” In addition to this way of describing the sacred, the authors provide us with some concepts that they describe to be “. . . at the root of the sacred (8) . . .” The following are the first four concepts these authors provide us with:

- A belief in or knowledge of unseen powers, or what some people call The Great Mystery.
- Knowledge that all things in the universe are dependent on each other.
- Personal worship reinforces the bond between the individual, the community, and the great powers. Worship is a personal commitment to the sources of life.
- Sacred traditions and persons knowledgeable in sacred traditions are responsible for teaching morals and ethics.

I want to acknowledge that notions of the sacred are extremely complex, and for the purposes of this essay cannot be represented with a large degree of granularity, and, furthermore, it is culturally inappropriate. What I am trying to do here is present a basic cultural model that provides the necessary information to initiate a level of understanding

required to illustrate how two cultural models about tools vary. I want to show how cultural values are coded to contribute to the influential properties of these technologies.

Notions of the sacred provide insights about the purposes and goals of Stickball. Like the Lacrosse stick, the Stickball stick is also a multipurpose tool. The purpose of the Stickball stick is not only to manipulate the ball during game-play, but also to facilitate the sacred, which is shared throughout a community (Cajete, *Spirit of the Game*). The sacred is a way to generate and maintain relationships that bring human connections with the elements of nature and with each other into consciousness. For example, a game may be played as a way to heal someone in the community, to enact war to settle a dispute, to learn about and reflect upon the natural environment and its resources, or to decide a community issue of importance (24-25, 30-31, 83, 96-97, 118).

For the ceremony of Stickball, the stick is uniquely designed through processes associated to traditional knowledge and craft. Because of the sacred role and properties of the stick, this implement will traditionally not be manufactured for sale, but will be uniquely designed and handcrafted to fulfill multiple purposes in service of the community or networked communities from which it was created.

The Lacrosse stick and the Stickball stick are both contemporary/modern technologies. Both are tools that are meaningful and useful to people today. I argue that one technology is not more advanced than the other. However, I do acknowledge, as we can already see in the previous section, that they do serve two very distinct cultural ontological and epistemological purposes. In the following paragraphs, we will look at how these respective sticks are constructed, and will start with the Lacrosse stick.

The Lacrosse stick is not a unique stick upon the completion of its construction. This is because it is manufactured as a fairly exact copy of thousands of other sticks like it that have also been produced in a factory. These sticks are mass-produced through mechanized processes: they are largely crafted by machines and not by human hands. In addition to this they are created out of synthesized materials such as metallic alloys, plastics, fiberglass, or any combination thereof. These are synthetic substances not produced in nature. Furthermore, the factory production and assembly of these materials is usually toxic to the natural environment. The industrial process of the Lacrosse stick is favorable for distribution and consumption throughout the world. Its creation, however, is not regarded as a sacred act within the classical cultural models of indigenous peoples.

The construction of the Stickball stick is a sacred tradition. In accordance with Native American traditions, the very creation of the stick itself is an expression of prayer (96-98). Because of this, it is constructed with human hands and prayers meant to create community reverence for this tool. This tool is specially made to extend the spirit of a player, and to strengthen the spiritual relationship between the player and the tool so that it extends the reach of the player, while also requiring the player's responsibility to use this tool to play the game morally and ethically in order to contribute towards the well being of the player's community (23-27, 33-34, 57, 97-99).

In the case of the Lacrosse stick, a player will have no emergent bond with his or her stick during the process of its construction. The Lacrosse player may also never build a spiritual reverence for his or her stick because it was created with repetitive precision through a mechanized and impersonal manner. The player was never invited into the

construction of the Lacrosse stick. In this sense its construction is spiritually disembodied from the player, the game, and the player's community. This is not to say that a Lacrosse player will not establish a sacred relationship to his or her stick; nor does it mean that the player will be unable to use the tool to mediate the sacred. For example, a Lacrosse player or team might subvert the industrial non-sacred creation of a Lacrosse stick by modifying and hacking the tool, expressing prayers upon the tool, or positioning the intentions behind its use in ways that enable it to contribute towards the wellbeing of a community. In these cases, a player may need members their communities to assist and/or mentor him or her with imbuing the Lacrosse stick with local indigenous values.

Returning to the construction of the Stickball stick, prayers accompany every aspect of the stick crafting process, and are offered to establish accountability towards the requirement that the stick is used ethically as it is intended by the stick maker (97). A Stickball stick is created with materials pulled directly from nature, such as wood, fibers, and leather (96-98). These carefully selected, and naturally occurring components, give rise to the stick as a living sacred tool connected to the life forms the materials originated from (96, 98). For this reason, the stick itself is also sacred, providing a pathway for its user to develop a sacred relationship with it.

Drawing a comparison between contexts through which tools are designed, the ways in which tools are constructed, the materials used for tool construction, and the emergent relationships that players develop with their tools for Stickball and Lacrosse, we can see two distinct Discourses of technology. Now that we have an understanding of

what materials both sticks are made of, how they are constructed, and for what purposes, we can also unpack the ways that these technologies connect with nature.

Beck, Waters, and Francisco state, “Native North American sacred knowledge is also responsible for teaching morals and ethics. (8)” They go on to extend this by stating, “Morals set the limits and boundaries of personal behavior and ethics to teach social behavior or the way individuals order their behavior with one another. (25)” This also connects to the way individuals order their behavior in relation to the biome they inhabit.

A large part of many indigenous sacred traditions is devoted towards efforts at maintaining sustainable relationships with local ecologies. This statement is not meant to reify the stereotype that indigenous peoples are sustainable, but to communicate that within the figured world of many indigenous peoples, it is seen as a traditional ethical and moral act to create technologies where only the greatest effort is taken to inflict the least possible harm to the environment (97, 99). This explains why the methods of production for Stickball sticks do not require that harmful toxins are released into the environment during the processes of fabrication, why the stick can easily go back to the earth, and why it will reverently be decommissioned when the time comes to retire the tool. In contrast, the Lacrosse stick is not always biodegradable, many harmful toxins are released into the environment as a byproduct of its fabrication, and it may irreverently be disposed of to the landfill when it is no longer useful.

Conclusion

Pervasive digital/electronic tools come from the same cultural paradigms of design, manufacturing, and usage as Lacrosse sticks. Because manufactured

digital/electronic tools pervade indigenous communities with their arrival into indigenous hands, in much the same way that a Lacrosse stick arrives into the hands of a Lacrosse player, at the time of initial acquisition, there is no pre-existing indigenous sacred connection to factory-produced tools. Perhaps it can be argued that this applies to everyone, indigenous and non-indigenous alike. Because people have no sacred connection with a technology like, say, a Smartphone, they also cannot intuit a set of ethical requirements for how to use the device responsibly. Unfortunately the user friendliness of technology does not encourage people to critically engage with the ideation or construction of many digital media tools, making it difficult for users to appreciate the tool's power, and therefore their responsibility in possessing the awesome powers that are extended to us by these tools (Sennett 171-173). This is a frightening analysis, especially since global power is now in the hands of the individual, who may not even consider ethics in relation to his/her digitally mediated power.

What we learn from the creation of the Stickball stick is that ubiquitous technologies must be engaged critically, and that traditional knowledge is useful for providing ways by which ethics can be generated and learned with respect to the design and uses of all technologies. Today there is overwhelming evidence that indigenous peoples, through pragmatism, have developed ethical relationships with tools whose origins come from abroad. The evidence is that indigenous peoples have rich traditions of engaging critically with foreign pervasive media of all types through processes of appropriation, hacking, and re-imagined use.

It appears that manufactured digital/electronic mediums cannot in and of themselves be sacred according to indigenous protocols for constructing tools. However, indigenous people have additional protocols for re-imagining these tools in terms of their designs, uses, and aesthetics. For example, there are many Native American teams like the Haudenosaunee Iroquois National Lacrosse Team who love, play, and remind the world about the origins of Lacrosse. These players play Lacrosse through their cultural ways of being as an act of indigenous self-determination and a mark of indigenous assent towards the reclamation of their traditional game⁶⁶ (Lyons, *X-marks*).

In 2010, the Haudenosaunee Iroquois National Lacrosse Team used their Lacrosse sticks to assert their people's sovereignty by presenting Haudenosaunee passports to gain entry into Britain to compete in the world championships (Kaplan). Upon arrival, their passports, regardless of treaties, were not recognized by Britain. Consequently the Haudenosaunee were left with no choice but to forfeit their place at the championships. This was despite an intervention by then Secretary of State Hillary Rodham Clinton who brokered a one-time waiver for the team to enter Britain. The team refused to accept the waiver, and continued to assert the legitimacy of their own sovereignty, and the legal legitimacy of their own passports by referring to international treaties.

Unfortunately, to the frustration of North American indigenous peoples, the treaties were once again not honored. But on the positive side of things, this scenario

⁶⁶ The Haudenosaunee Iroquois National Lacrosse Team state the following on their website (About Us): *The Iroquois are the originators of the modern day game of Lacrosse. Shrouded in time, Lacrosse was played among the Confederacy long before the coming of the Europeans to the shores of North America. It can be said that when the Europeans first came to America, Lacrosse was one of the most popular and widespread games played across the continent and with many variations. The long stick game played internationally today belongs to the Iroquois.*

provides a powerful example of indigenous peoples modifying and hacking manufactured Lacrosse sticks, expressing prayers upon these tools, and situating the intentions behind their use in ways that help empower a community's sovereignty. In the spirit of humor, this doesn't account for the fact that it's hard for any team to beat the Haudenosaunee at Lacrosse, which may have factored into the reason why Britain refused to recognize Haudenosaunee passports! In the Americas, these types of self-determined actions are tied to an indigenous relationship to the sacred. This enduring spirit of indigenous survival and resistance can help ensure that "classical" indigenous frameworks are maintained regarding the relationship between indigenous values and tools.

Through the evidence and arguments I have provided in this paper, I respectfully and humbly present the idea that sacred practices can potentially help neutralize the colonial potential of pervasive technologies, so that they begin to interface with indigenous worldviews. In this respect these manufactured tools are powerful, and I propose that it is conceivable that they can be used to embody and facilitate indigenous knowledge systems, as well as to engage with the world in ways that are ethical. At the very least, like all other pervasive aspects of colonization, we can see that indigenous peoples can certainly appropriate these tools and their associated literacies to serve indigenous sovereignty. These ideas may prove to be effective ways that indigenous peoples can appropriate pervasive technologies for their self-determination.

The ideas presented in this paper represent the deeper reasons why I argue it is an essential act of Tecno-Sovereignty to appropriate digital/electronic technologies by hacking and reimagining them based upon the frameworks of indigenous knowledge and

how this knowledge is applied for the ethical design, construction, and use of tools. This could possibly allow communities to realign pervasive media in ways that make it more culturally sensible. As I have written in “Our Digital Tongue is Tecpatl, a Flint Knife:”

Indigenous peoples have a long history of hacking and modifying pervasive technologies as a way to achieve forms of innovation. Rasquachismo, for example, is a Chicano folkloric practice and indigenous knowledge that demonstrates the adaptive reuse of foreign artifacts and the resourceful application of discarded materials through an extemporaneous design process (Ybarra-Frausto 128-150). The designs that result from this are functional, and always possess culturally responsive semiotic and aesthetic values. The rasquache creation and use of tools demonstrates innovation, and a form of critique, learning, resistance to colonizing forces, and self-determination.

Since many indigenous peoples already have a deep tradition of culturing innovative practices like rasquache, and since they have traditions for supporting ethics for the design, construction, and uses of technology, it seems sensible to propose that these innovation strategies and traditions be used to respond to pervasive digital media. Using strategies of indigenous hacking and traditional ethics to support culturally responsive modifications of foreign pervasive digital technologies is an X-mark of self-determination (Lyons, *X-marks*). This is opposed to code switching from one’s cultural discourse when using pervasive foreign technologies (Gee, “Discourse” 374-376).

Technological X-marks connect us back to indigenous capitalism, where one of the capacities building aspects of repatriating indigenous economic systems requires the self-determined acquisition of digital media literacies skills that include computer programming, digital media production, and physical computing (Lyons, *X-marks*). This is because, from an economic perspective, high speed information technologies and economic systems are inextricably interwoven together, meaning that indigenous

economies will only be able to interface with markets via digital media, both, because this is the only way global market-systems operate, and because many indigenous youth are digital natives who do not understand the world without digital media.

Not only are indigenous youth becoming more entrenched in the ubiquity of pervasive digital media, but pervasive digital media is also becoming more interconnected with the physical world itself. For example, it used to be that first nations communities used oral traditions and public memory to manage cognitive maps and their territorial resources. Now some communities are using computer global information systems that allow them to map, model, and query large amounts of data for the management of their lands (Gardner-Youden et al. 35-41). This not only provides these indigenous communities with the capacities to manage their resources from economic and conservation standpoints, but it also allows them a way to track, survey, and legally prevent subversive corporate plans to extract resources from their lands.

With respect to capacity building, from a culturally pragmatic perspective, the art of hacking provides a culturally responsive framework for the acquisition of digital media literacies skills due to traditions of hacking material culture that span over 500 years of colonial resistance. Beyond that, the spirit of innovation exhibited by indigenous hackers along with traditions for supporting ethics for the design, fabrication, and uses of technology most likely span millennia of indigenous scientific inquiry.

From the standpoint of economy, the art of hacking and indigenous ethics empower the economic and indigenous value-laden production of useful technologies. Through practices of salvage, hacking, and modification, culturally responsive inventions

can be scaled across communities with little monetary resources required. This economy is enhanced due to surpluses of materials designed with embedded obsolescence, which can be recycled into useful innovations at relatively low costs.

Indigenous peoples demonstrate that hacking is a way to bring innovation home with little monetary investment. Indigenous hackers also demonstrate that it is possible to not only subvert the high costs of cutting edge technology through an “invent and build it yourself” culture, but that the creation of new culturally responsive innovations via the value imbuing processes of indigenous hacking also help build local economic systems that increase the self-sufficiency of indigenous communities (Martinussen).

The practices of hacking within indigenous communities have multiple benefits that include capacity building investments toward the construction of more robust economic and technological systems, as they also increase various local community technology literacies skills while maintaining cultural codes of ethics. This kind of critical, cultural, rhetorical, aesthetic, pedagogical, and economic engagement with digital media is necessary for indigenous sovereignty, and its need will inevitably increase as the speed, ubiquity, and the experiential definition of digital media advances over time and throughout the world.

Essay 3.5 – Lowriding the Information Superhighway

In the United States and many countries around the world, high-speed communications networks are evolving through advancing satellite, cellular, and fiber optic technologies. The high-speed capacity for people to move sophisticated media through these networks has increased the real-time fidelity of human communication. This media flows through a networked roadmap referred to as the Internet. The outcome of this phenomenon has led to a fast paced digital age that is exponentially accelerating.

One of the early twentieth-century inventions remaining ever-present to the digital age is the automobile. Until the time of its ubiquity, humans had never experienced higher levels of mobility and velocity than what this technology had to offer (Bratton 16). Sure there was the train, but the train was tied to tracks, and in the case of the horse drawn wagon, there was mobility, but these wagons could not travel at the higher speeds of automobiles. This history of increasing mobility and velocity repeats itself again as people around the world experience the ascent of a new technology. Similar to the advent of the automobile, humans are once again experiencing new forms of mobility at increasing velocities through digital media⁶⁷.

In a fast-paced, capitalistic society such as that of the United States, the development of popular consumer technology is often not informed by minoritized

⁶⁷ Digital media manifests itself as multimodal and (or) interactive feedback in the form of text, images, sound, moving images and force feedback (such as the vibrations from a smartphone). Digital media is created and broadcasted via computational processes using binary code to represent information within virtual space referred to as the Internet, the World Wide Web, or cyberspace. Broadcasts of digital media from points A to B can occur almost instantly throughout the world with the simple click of a button (like when sending out email). This definition is supported and extended by the anthology of articles titled *The New Media Reader*.

communities. Part of the reason why participation is not inclusive is because many these communities represent small economies of scale, which have a smaller monetary impact on the consumer market. This is due to small consumer contingencies and their lower economic status. Unfortunately, this issue often leaves indigenous⁶⁸ communities invisible because they lack the spending power to catch the attention of the market (Denegri-Knott, Zwick, and Schroeder 950-966). Because of this, it is rare that indigenous populations in the U.S. control the development of consumer tools prior to their placement on the market. This situation leaves many indigenous populations with little choice but to cope with the implications resulting from the colonial and imperial values that marketplace technologies encode.

As a way to resist colonial assimilation, many indigenous peoples throughout the world respond with ingenuity (or “indigenuity”) to the influences of consumer technologies (Nango and Thoresen). This occurs through the appropriation and repositioning of marketplace technologies for purposes originally unintended by commercial technology designers (Kawagley 92-93). The purposes of this are often to address specific community needs, and to resist the colonial values embedded within the designs of these tools. This pragmatic repositioning of tools to support indigenous life has

⁶⁸ According to Merriam-Webster.com, the term indigenous is defined as “produced, growing, living, or occurring naturally in a particular region or environment” (<http://www.merriam-webster.com/dictionary/indigenous>). In this paper I use the term Indigenous refers to refer to peoples who maintain they have inhabited their local geographies since the beginning, as told in their creation stories. In this paper I will use the term “indigenous” as a way to address the globalizing forces of digital media as affecting diverse peoples around the world. However, in doing so I also acknowledge that peoples who are indigenous to land are diverse groups of people that are not necessarily unified. My use of the term indigenous is not to reify “indigenous” as a unified body of people, but to consider a large diversity of peoples around the world who claim to have inhabited their land since time immemorial. This also includes peoples who disagree with each other, or do not claim to be affiliated with each other.

been one of the fundamental incubation spaces for the development of disruptive innovations for over 500 years of colonial resistance. An example of this is the appropriation of the automobile by Chicanas/os⁶⁹ for the creation of the lowrider⁷⁰.

Many of today's changes are no longer driven by the automobile, but through new possibilities resulting from the ubiquity of digital media technologies. These new possibilities come with cultural implications for indigenous peoples. The implications of digital media vary among diverse peoples that are indigenous to differing lands, and they do so in ways that can have both positive and negative outcomes. As a mestizo, I believe that this digital age provides indigenous peoples throughout the world with new opportunities to reflect upon lessons learned from lowriding. I advocate for this reflection because lowriding demonstrates how a marketplace technology is repositioned by

⁶⁹ Many Latino/a Americans self-identify as Chicanas/os to signify their affiliation with an indigenous consciousness that began its emergence during the Mexican American civil rights movement led by Cesar Chavez in the 1960s. Chicana/o ideology and culture is a construction of ethnically diverse people who consist of recent Mexican immigrants to the United States and mestizas/os who are from different parts of the United States. Mestiza/o is a word used to describe a person who is of mixed descent. It is often used in the Americas to describe someone who is of American Indigenous (Native American and (or) Indigenous Peoples of Latin America) and European ancestry. Historically the Chicana/o movement is geographically rooted within the southwestern United States, but it has been spreading throughout the United States since the industrial revolution. Chicanas/os embody a multiplicity of cultural and national heritages that define a people from the U.S./Mexican borderlands (Castro 46-47). In this paper, I connect Chicanas/os to the indigenous part of their heritage to address the issue of indigenous self-determination in a digital age.

⁷⁰ Lowriders are modified automobiles driven slow as the intended function of their design. The characteristic modification of a lowrider is a low carriage ground clearance so that the body of the car travels as close to the ground as possible (Calvo 3). This low ground clearance will cause a driver to operate a lowrider both cautiously and patiently to avoid scraping the undercarriage of the automobile. This is where the lowrider mantra "low and slow" derives. The term "lowrider" is also used to refer to the creators, drivers, and passengers of lowrider automobiles (I will use the term lowrider in quotes as a way to apply the term to signify a creator, driver, or passenger of a lowrider automobile) (Chappell, *Lowrider space* 2-3). These lowrider exhibitionists contribute to a complex community of practice giving rise to lowrider culture or "lowriding." The practice of social networking and connected indigenous knowledge via building, driving, and showing off lowrider automobiles is one of many Chicana/o traditions. The hacked and modified nature of lowrider automobiles is of central importance to the resistance and survival of Chicanas/os.

Chicanas/os to serve the needs, desires, and sustainability of their communities, which have little choice but to operate within U.S. capitalism.

As a tool for Chicana/o self-determination⁷¹, the lowrider is an automobile that has been “(re)formed” by Chicana/o hands to provide rhetorical space for local community dialogues, which I refer to as lowrider space. Depending on the need, these dialogues may be exclusive to a given community or they may reach out to communities and cultures beyond Aztlán⁷². As a result of cross-cultural community outreach, lowriding has become part of many cultures throughout the world. However, for the purposes of this essay, I will focus on lowriding as a present day Aztlán.

Chicanas/os are a mestizo people in the United States with no federally recognized indigenous land base to call their own, or state recognition of their status as indigenous. Their indigenous heritages include lineages from indigenous peoples throughout the United States southwest and that span indigenous lineages along major ancient indigenous trade arteries to and from Mexico City and other city centers. These routes were the dominion of Chicana/o indigenous ancestry long before the US/Mexican border codified indigenous peoples from North and South of the border as alien to each other. This “othering” of indigenous peoples has been produced through erasures of indigenous relationships resulting from colonial English, French, and Spanish rivalries, differing state politics, and European colonial language differences. The indigenous

⁷¹ The ability for Chicanas/os to develop their own cultural identity and practices that meet the social, spiritual, educational, and legal needs and desires of their communities.

⁷² Chicanas/os often define Aztlán as the United States Southwest and Southern California. Aztlán is the legendary sacred homelands by which the central indigenous Mexica originated from prior to establishing an Aztec civilization (Castro 13-14). In this paper I refer to Aztlán as not only a geographical space, but also a state of being, and a spiritual consciousness.

lineages of Chicanos include heritages such as Pueblo, Apache, Comanche, Navajo, O’Odam, Hopi, Yaqui, Purhepecha, Mexica, and Maya ancestry. This list is not comprehensive and represents only a small fraction of the indigenous lineages and knowledge embodied by Chicanas/os.

Chicanas/os are a political contingency of mestizos in the United States who since the 60s have been addressing political issues tied to the displacement of mestizos by processes of colonization, imperialism, globalization, capitalism, and the racism tied to their mixed European and Native American/Mexican indigenous ancestry⁷³. Mestizos are a people whose indigenous identities remain destabilized by these forces, yet they remain unified as regional groups embodying both pan and local cultural distinctions. Without lands to develop their own tribal identities or sovereign geopolitical borders, Chicanas/os must construct alternative spaces. In this essay I hypothesize that in lowrider space, Chicanas/os are always on the move, free to (re)invent Aztlán in whatever ways they must in order to maintain their unity and cultural sovereignty⁷⁴.

Within this context, lowrider space is a rhetorical location that emanates from a Chicana/o consciousness and the people’s connection to their ancestral homelands. Therefore, upon their ancestral lands, lowrider space is mobile, networked, and dynamic. Because of its adaptability, lowrider space is an example of tactical media with the intelligence to configure and re-configure itself as Aztlán (Chappell, *Lowrider space* 1-9; Raley 15-19). It is a location that consists of many lowriders capable of adapting to, as

⁷³ The Chicana/o movement of the 60s extends Mexican American civil rights movements dating back as early as the 40s.

⁷⁴ Cultural sovereignty is a people’s effort to “exercise their own norms and values in structuring their collective futures” (Coffey and Tsosie 191).

well redefining, borders, changes in time, literacies, learning, culture, society, traffic, aesthetics, economy, technology, politics, and law.

Today lowriding exists as an indigenous technology within a digital age. This is because lowriders and digital media are currently in development and use. In other words, they both occupy the present, and they both mediate travel and communication. Because they parallel each other, I imagine lowrider space and cyberspace as a Chicana/o *Convergence Culture: Where Old and New Media Collide* (Jenkins iv). At the point of spatial collision, between atoms and bits⁷⁵, I imagine not devastation, but a renewal or creation of something new. In my dream, digital media and lowriders interface with each other as a convergence culture causing a birth of new Chicana/o theories, literacies, and technologies that constitute an indigenous convolution media.

The following analogical questions come to mind as I imagine this convergence: What would the parallel of lowrider space look like within the context of digital media? How could Chicanas/os apply the rhetorical skills developed through lowriding to a practice of digital media? How would a Chicana/o expression of digital media lead to new literacies in the way it did through lowrider space? Like the hacking and modifications of automobiles in lowriding, how would Chicanas/os hack and modify digital media to exercise their self-determination? The purposes of the following arguments are not to answer these questions, but to illustrate why they may be of current value to Chicana/o and other indigenous communities.

⁷⁵ I am using atoms to refer to the material world, and bits to refer to the virtual world. Atoms are the basic building blocks of matter in the physical world, while bits are the basic building blocks of computer code through which everything is constructed in the virtual world.

Today, lowriders as Aztlán constitute a media lab for the engineering, design, and artistic expression of Chicana/o rhetoric. In this context, lowriders can be thought of as mobile rhetorical spaces that define cultural landscapes where Chicana/o Discourse⁷⁶ is emergent, expressed, secured, and broadcasted. In lowrider space, Chicana/o Discourse occurs on American avenues, drives, boulevards, strips, streets, parking lots, city parks, and at cars shows. These spaces are constantly “(re)rendered” as Aztlán by Chicana/o re-imagined indigenous cultural practices. Examples of this include the lowrider car show, constructing lowriders, cruising, and parking lot loitering as gatherings that extend indigenous social ceremonies and story work (Calvo 3, 146, 151, 167-169, 186, 194; Chappell, “Lowrider Cruising Spaces” 6a; Sandoval 7-8, 20, 63-75, 248).

Through lowriding, lowriders become a rhetorical place where Chicanas/os work to recover stories, history, language, land, culture, relationships, and human dignity from colonial and imperial subjugation (Bright 584-585, 586, 590-591, 595; Calvo 20, 181, 229; Ides 104, 165; Sandoval 1, 3, 8, 46). In this paper I argue that the construction of lowrider space is made possible in part through the salvaging, hacking, modification, and adaptive reuse of the automobile⁷⁷. This makes it possible for “lowriders” to reposition the automobile as an indigenous tool for mediating the complexity of Chicana/o worldviews (Sandoval 8; Calvo 183-185).

⁷⁶ Social Linguist James Paul Gee describes “. . . Discourses with a capital ‘D’” as “. . . not just language, and surely not just grammar, but saying (writing)–doing–being–valuing–believing combinations” (“Social Linguistics” 151).

⁷⁷ I assert that the unaltered factory automobile is a symbol, product, and tool for imperialism, capitalism, and globalization.

Although I posit that lowrider space is a rhetorical space for Chicana/o self-determination, and that lowriders are a present day Aztlán; I also acknowledge that this does not make lowrider space an idyllic location. Again, it is a place where Chicanas/os work to achieve self-determination and therefore is a space where there are both failures and successes. Lowrider space is a Chicana/o place architected within historical and ongoing layers of colonization, imperialism, and capitalism, and, therefore, it often reflects the masculine hegemony of these forces. “Lowriders” are indigenous entrepreneurs who create their own local economies of scale designed to ensure the sustainability of their own employment and the practice of “lowriding” (Chappell, *Lowrider space* 3). Because of this, Aztlán is a vexed space subjugated by the forces of American consumerism as it attempts to participate, but on its own terms. This is paradoxical because “lowriders” resist assimilation; but at the same time, it costs money to build or repatriate Aztlán.

Although I celebrate the lowrider in this paper, it is not my intention to romanticize it. My intention is to examine lowrider space as a human construct that reflects the complex development of Chicana/o culture as it seeks to achieve spiritual and intellectual consciousness. As an indigenous mestizo, I will present the lowrider as an indigenous metaphor for the potential salvage, hacking, modification, and adaptive reuse of digital media by indigenous peoples. To achieve this goal, I will first contextualize lowriding by presenting its history and the role of gender in lowrider space.

During the 1920s the automobile began to take its place as a definitive part of the American dream. This was the result of technological breakthroughs that led to the mass

production and middle-class affordability of automobiles (Ides 102). As automobiles took their place within American culture, they extended the ability of humans to perform geospatial communication across distance through body transportation and the shipping of correspondence with greater accessibility and speeds. During this time, the ascending relationship between humans and automobiles was made possible by the increased production and affordability of automobiles to the consumer (102). At the time that automobiles were emerging in America, this transportation technology ushered in new cultural, social, political, legal, and economic implications (Calvo 135-138). For example, automobiles made it possible for industry to increase the scale of labor forces through the mass transportation of bodies, sometimes from greater distances, to and from the workplace. It also made it possible for people to travel out of their segregated neighborhoods to occupy previously inaccessible spaces (Calvo 196; Ides 118, 165; Sandoval 40). However, this was made possible by the automobile to a limited degree.

On the road automobiles became fashion symbols of status, where the rich could afford to travel in more expensive vehicles marked by luxury and/or sport. In capitalist America these vehicles were brands with social cache, and even though vehicles allowed for the poor to share road space with the rich, these status markers constructed class (Calvo 135, 138; Ides 5, 110, 131; Sandoval 40, 45;). Throughout much of the 20th century this system of semiotics was contested on American roads via market brands and automobile modifications (Calvo 135-141; Chappell “Lowrider Cruising Spaces” 1-2; Ides, 118, 121; Sandoval 30, 45-46). Today the road continues to remain a large part of

the American ideology of freedom: it is a contested geography often delineated by race, gender, class, and culture (Ides 105-109, 112-119).

During the 1960s, a youth movement attempted to challenge segregation in Los Angeles with their efforts to build social networks across race and class. During this climate of civil rights activism, the L.A. youth sought to cruise the strips and boulevards as a way to build social spaces for the participation of multiple cultural discourses (99). In their answer to the call of the Hot Rod, Chicanas/os contributed to the cultural diversity of these spaces with an inverse response they referred to as the lowrider.

Although the lowrider contributed to the diversity of the L.A. cruising scene of the 1960s, it was originally conceptualized during the 1950s in response to a Hot Rod culture where white youth often marginalized people of color (101-102, 114, 165). As lowriding became popular, it provided Chicanas/os with the means to rhetorically broadcast their unique identities within the social space that the youth created through the practice of cruising cars. Scholar of L.A. youth car culture, Matthew Allan Ides describes this scene during the 1960s as comprised of people of diverse backgrounds sharing a “. . . youth car culture (99).”

In terms of the Chicana/o broadcast of messages via the lowrider, Ides argues that Chicanas/os positioned their cars to critique segregation within the city after World War II, as well as the speed at which L.A. culture was operating (104, 113, 117). Unfortunately as the years passed and lowriding evolved, it began to be misinterpreted by authorities as a practice associated with gang activity (Calvo 4). It was not only the

lowrider that was targeted by authorities, but also the Hot Rod, which was associated with misadventures between youth and automobiles (Ides 101).

William Calvo, a scholar of lowrider production, argues that, with respect to lowriders, misunderstandings by the authorities were due to some “lowriders” being linked with gangs, and the visual interconnectedness between lowriders and street gang semiotic systems (4). According to Calvo, these factors coupled with xenophobia led to laws against the cruising of lowriders, which spawned a windfall of anti-lowrider legislation across several states (4). As a result of these choices by government, “lowriders” have focused for over three decades on adapting their practices to protect and foster the self-determination and sovereignty of lowrider culture, and to use this space to support an evolving Chicana/o culture.

During the late 1960s and early 70s, “lowriders” became targets of xenophobic authorities driven by concerns regarding a “rebellious” youth culture and automobiles. During this time the lowrider, a flamboyant signifier of Chicana/o culture, made Chicanas/os vulnerable to racial profiling and harassment from authorities, which included lawmakers and police (Calvo 241-242; Chappell, “Lowrider Cruising Spaces” 6-10). This issue continues to this day. During the 1970s, “lowriders” began to dialogue with newly established *Lowrider Magazine*, which was published to address this and other Chicana/o civil rights issues during the 70s. This is a relationship that continues to serve the Chicana/o movement in positive and negative ways. In this case the audience/media dialogue concerning *Lowrider Magazine* and “lowriders” has had, for better and for worse, tremendous impact on the development of lowrider space.

According to Ides, lowriding and hot rodding have largely been exercises in patriarchy, where male sexual discourse has been woven into the technical language of consumerism and automobile mechanics (112). This is never more explicit than in *Lowrider Magazine* from the 1980s to the present. This has been an issue that has plagued the Chicana/o movement ever since the magazine, under new ownership (this time corporate), realized it could maximize profits by generating and marketing images of hypersexualized female bodies positioned in juxtaposed relationships to lowriders.

For three decades *Lowrider Magazine* has continued to feature erotic depictions of female bodies in response to consumer demand. This publication and its readership have had a profound influence in reinforcing patriarchy within lowrider space. To complicate this space, and to its credit, the magazine also provides an editorial section where both men and women often protest its use of female models posed with lowriders while wearing stilettos and revealing swimsuits (Sandoval 191, 207). In terms of the feminist debate found within the editorial section, there is women's rhetoric of various arguments to reject, defend, and critique *Lowrider Magazine's* choice to feature these scantily clad models in its publication. The editorial also mediates this dialogue between men and women. Furthermore, the magazine is a space for Chicana's to openly dialogue with each other, and freely voice their perspectives on a large range of Chicana/o issues and experiences (193). In these conversations, women challenge the magazine to feature sexy male models posing with lowriders (190-198, 234-236). Reminding *Lowrider Magazine* that women are also a part of their readership. Although the magazine promotes this dialogue, it has never taken responsibility for its misogynistic actions.

Lowriding as a gendered location is complex and tied to Chicana/o, American, and consumer hegemonic masculinity, which all work in concert with one another. Because of these factors I present lowrider space as a gendered rhetorical space. To address this, I will frame my analysis of lowriders within a theory of feminist rhetorical space by Roxanne Mountford who states, “Rhetorical space is the geography of a communicative event, and, like all landscapes, may include both the cultural and material arrangement, whether intended or fortuitous, of space” (42). From this definition, Mountford argues, “The cultural is the grid across which we measure and interpret space, but also the nexus from which creative minds manipulate material space” (42).

I have chosen Mountford’s framework for rhetorical space because it accurately describes lowrider space. Furthermore, Mountford goes on to extend our understanding of lowrider space by explaining that many rhetorical spaces are gendered. In her work, Mountford argues that an example of a gendered space is the pulpit, and, like the pulpit which is mostly occupied by men, there is overwhelming evidence in addition to *Lowrider Magazine* suggesting that the lowrider is also by and large a gendered location (Calvo 172-180, Sandoval 176-245). Highlighting these aspects of lowrider space is essential to an analysis of lowriders in a digital age. To extend this acknowledgement that lowrider space is a largely gendered location, I also acknowledge that the hegemonic masculinity found in lowrider culture paradoxically contributes to and undermines Chicana/o self-determination. This is the outcome of lowrider space that is a nexus of sexuality complicated by both men and women.

In addition to acknowledging lowriding as a gendered space and its sexually complex role in Chicana/o self-determination, I also acknowledge that it may or may not be useful in determining which aspects of Chicana/o culture Chicanas/os will continue to honor, as well as aspects they want to modify. With that said, women “lowriders” are active stakeholders co-constructing lowrider space with men (Bright 594; Calvo 172; Sandoval 181-185). Women “lowriders” are builders, drivers, passengers, mothers, sisters, daughters, scholars, lovers, editorial rhetoricians, and swimsuit lowrider models wearing stilettos. All of these women contribute in powerful, essential, and meaningful ways to the ongoing intellectual, spiritual, and sensual development of the Chicana/o consciousness-building project.

As new automobile technologies remain largely delineated by factors for maintaining America’s social structure. Lowrider space continues to respond dynamically and accordingly with new technological advances for car modification (Calvo 253). Lowriding is a Chicana/o knowledge system emergent in a world that continues to use automobiles to construct race, gender, class, and culture (137-138). It is at once complicit, yet strategically disruptive to American social hierarchies. In addition to its social conundrums, lowriding is an act of resistance to the increased velocities of movement and communication in the world. It is an enduring critique of a fast-paced world where bodies are positioned as instruments, and where many indigenous worldviews, which include epistemologies and ontologies regarding time-space, are disrupted (Marazzi 44, 117-118).

Today many humans around the world live in a digital age, and the globalizing forces of this age support rapid social, political, cultural, and economic changes. Digital media is one of these globalizing forces, and it is uniquely fueled by an unprecedented continuum of rapidly advancing technologies that mediate global communication at ever increasing velocities and levels of interactivity. In the U.S. these advances have accelerated the pace of society in ways that were similarly experienced by people when automobiles first became part of the American way of life during the early twentieth-century. And like the factory automobile, the time-space dimensions of digital media also collide with indigenous tools designed to facilitate a more patient way of life.

An approach to lowriding and digital media as convergence culture could be that Chicanas/os use their lowrider skills of salvaging, hacking, modifying, adaptive reuse, and appropriation⁷⁸ to slow digital media systems down. By this, I am not necessarily suggesting that Chicanas/os should literally slow digital media down. But that digital media should be brought into frameworks of indigenous knowledge systems and worldviews in order for it to become useful for indigenous self-determination.

The lowrider, as a theoretical metaphor, presupposes that a technology (such as the automobile) that increases the speed of (transportation/communication) systems can be modified to create a new tool (as in the case of the lowrider itself), which is then used

⁷⁸ Rasquache is a tradition where Chicano communities demonstrate their ability to be creative and resourceful with foreign artifacts while keeping within the frameworks of their cultural systems. Chicanos have innovated designs for community and the home through processes of hacking, appropriation, recycling, and adaptive reuse. They have employed these methods through a process of creative improvisation in order to transform foreign artifacts into culturally situated implements of symbolic, aesthetic, spiritual, functional, and local economic value. This is done through design and use (Ybarra-Frausto 155-157).

to hack (break into) a system (of street traffic) in order to transform it in ways that are culturally responsive (to construct Aztlán by slowing movement in accordance with an indigenous worldview). Within the framework of convergence media, this metaphor analogously points to the speed of digital media, which through digital media literacies can be modified by indigenous peoples to create tools that, like the lowrider, also operationalize indigenous sovereignty.

Through convergence culture, I am arguing that lowriders as modified tools for hacking systems, are evidence that Chicanas/os possess fundamental knowledge for how to claim their digital commons (Aztlán in cyberspace). I am arguing that this metaphor is also an analogue because the networked architecture of street systems is not unlike that of digital media systems. Both are built upon algorithms of traffic, pathways, protocols, points of origin, binaries (like stop/go or true/false), decisions, and destinations.

Throughout the colonial evolution of industrial efficiency, many indigenous peoples throughout the world have demonstrated excellence through the salvage, hacking, recycling, appropriation, and adaptive reuse of colonial and industrial productions. Through these processes, many indigenous peoples produce new tools that effectively support their respective ways of being while avoiding assimilation (Bright 583-605; Kawagley 66-69; Martinussen 1-3; Müller, “An Other Path” 235-257; Nango and Thoresen 1-5; Oskal 1-5; Ruuska 586-597).

Through their own traditions of resistance, I argue that Chicanas/os are currently equipped with the theoretical knowledge, wisdom, and practical experience to re-imagine digital media in ways that are aesthetic, symbolic, and functional within the frameworks

of their ontologies and epistemologies (Ybarra-Frausto 155-157, 160-161). What is currently missing, to some degree, is the computer science capacity⁷⁹ among Chicanas/os to construct a cyber Aztlán. However, “lowriders” inspire all peoples to see that if there is a cultural impetus for the acquisition of technical knowledge, the learning of such things will happen with or without the help of schooling. This is provided that a people have access to materials and methods of production.

Digital native Chicanas/os appear to be acquiring this access as evidenced, not in standardized school, but by many of their contributions on the World Wide Web. During a presentation at the Games + Learning + Society conference in 2009, digital media learning scholar, James Paul Gee, presented the idea that many students from minoritized communities who are failing in schools develop content for the Internet.

So far I have presented the lowrider as an indigenous metaphor for the potential salvaging, hacking, modification, and adaptive reuse of digital media by Chicanas/os. Now that I have unpacked this metaphor I will address the following questions as a framework for the analysis of lowriders, this is to identify possible best practices for a Chicana/o expression of digital media: (a.) What is the purpose for hacking, chopping, and modifying classic automobiles within Chicana/o culture to create lowriders? (b.) What role do indigenous worldviews play in the crafting methodologies and methods of a lowrider? (c.) How are lowriders used?

According to lowrider scholar, Brenda Bright, the lowrider is an extension of the human body (603-604). Bright argues that “lowriders” (those who build and drive

⁷⁹ This is changing as digital natives (kids who grew up with digital media) come of age.

lowriders) and lowriders (the modified cars) come together as cyborgs, which are organism/machine hybrids. Bright suggests that this framework “. . . transcends the dualisms that posit what seems to be more clearly bounded, somewhat autonomous relations between people and machines, and people and commodities. (603)”

Bright’s framework effectively pushes against technology ideologies such as technological neutrality and technological determinism, which both assume there is nothing inherently cultural and political about a tool (Mackay and Gillespie 685-716; Moñivas 310-327). These ideologies argue that what makes a tool cultural and political is the way it is used. Contrary to these ideologies is the conceptual framework of the cyborg, which suggests that humans and technology form a bound relationship of hybridity emerging from a complex bi-directional communication model between organism and machine as one. For example, a person cannot decide to drive a lowrider at a fast speed, but instead is forced to drive it slow because the Chicana/o cultural logic of time is embedded into the lowrider’s design. The implications of this are that the lowrider forces the driver to perform transportation at a constrained speed. At the same time the driver uses the lowrider to manipulate the built environment. This example debunks the ideologies of technological neutrality and technological determinism, which fail to account for how cultural values are stamped onto and encoded by technologies.

Chicanas/os create lowriders to transform factory-produced universal artifacts into placed-based or local cultural artifacts. The purpose for this modification is to resist global assimilation by producing localized culture via mass-produced material (Bright 584-585). In other words, the lowrider is a way for people who have been displaced from

their land to avoid further displacement by resisting the cultural production of commodities, but while also expressing themselves through material (Calvo 15). Scholars provide us with evidence that the customization of lowriders is tied so closely to the aesthetics of group practices like car clubs, that it becomes virtually impossible for large economies of scale (in terms of the marketability of lowriders) to emerge beyond locality (Bright 604-605; Calvo 7-8).

Evidence from the automobile industry shows us that the concept of the hot rod has been co-opted by the auto industry in the mass production of sports cars, whereas “lowriders” remain the only producers of lowriders (Ides 169). This evidence demonstrates that even though “lowriders” operate within the framework of capitalism, they have found a way to extend the indigenous practices of their ancestors by constraining most of their production to local economies of scale. As a way to resist globalization, the lowrider becomes a space where “lowriders” engage in cultural production with indigenous protocols that resist commodification of lowrider culture beyond lowrider space (Calvo 140). These protocols make Aztlán difficult for industry to replicate and market.

Lowriders also emerge as a function of mestizo epistemologies. Automobiles are hacked and modified into lowriders because this kind of an automobile is a form of transportation that demonstrates a borderlands mestizo/a identity. This responds to the American practice of citizens using automobiles to express themselves, and the idea that United States citizenship is demarcated by driving and riding in automobiles (136). The mixture of American and Mexican Nationalism drives one aspect of Chicana/o

borderlands identity expressed by “lowriders,” and to be even more specific, lowriding originated in the borderlands where American and Mexican nationalism ceases to exist. At the borderlands a blending of discourses creates new indigenous expressions controlled by mestizas/os (Anzaldúa 3-4, 77-80).

Chicanas/os also create lowriders so they can be used to mediate mobile signifiers of Chicano culture. Lowriders are experiential media systems that disseminate moving image and sound through embodied experience. For example, lowriders are mobile sonic and visual billboards that provide “lowriders” with the ability to broadcast multimodal messages to traffic throughout an urban space, regardless of spaces demarcated by race and class (195). Like billboards, lowriders are designed to call out to potential audiences for attention and to proliferate spaces with an indigenous worldview.

Lowriders are created to strategically establish a flamboyant semiotic system in public spaces (Calvo 189-194, Chappell, “Lowrider Cruising Spaces” 1-2, 6). Chicanas/os use lowriders to publically broadcast their cultural expressions of color, movement, images, music, sexuality, history, spirituality, etc. In lowrider space vivid colors attract potential lovers, narrative mural paintings raise consciousness, music of the borderlands projected at a high volume expands the physical space of the vehicle, slow driving deliberately reduces the pace of society, and hopping the car up and down with hydraulics becomes a display of engineering prowess. These are but a few examples of lowrider signs and their associated purposes. This semiotic system is used to communicate messages to prevent indigenous erasure by reminding people about the enduring presence of Aztlán and to demonstrate its ongoing construction.

In contrast to the messages that emanate from lowriders outward, Chicanas/os also use lowriders to create their own sovereign spaces where knowledge is generated and contained (Calvo 191-192). Within these spaces, “lowriders” can safely express their culture free of the repercussions of outside prejudices. These spaces are also constructed as places by which Chicanas/os can escape into a world of sexual fantasy and cultural dreams, allowing a break from the oppressions of life in the barrio, and to have sovereignty outside of the construct of nations that oversimplify mestiza/o identity as one that is “hybrid” (Calvo 196-199; Chappell, “Lowrider Cruising Spaces” 1). From this vantage of lowrider space, the lowrider is worn as armor, which protects and contains cultural knowledge while providing a place where consciousness can be generated.

As previously mentioned, Lowriders are flamboyant, and are used by “lowriders” to communicate messages. I also stated that one purpose of “lowriders” is to broadcast messages to attract potential lovers. “Lowriders” engage in courting rituals by showing off their lowrider to demonstrate their engineering prowess, aesthetic values, spirituality, cultural knowledge, etc. as a way to impress potential lovers (Calvo 190-191, Chappell, “Lowrider Cruising Spaces” 4, Ides 100). This sexual flamboyancy makes “lowriders” easily identifiable on the road, and therefore, vulnerable to agents of imperialism, colonization, capitalism, and globalization. All of which seek the assimilation and erasure of indigenous cultures (Brayboy, “Toward a Tribal Critical Race Theory” 429-430).

In their efforts to silence Chicanas/os in public spaces, civic authorities have created policies and racial profiling practices intended to subjugate lowrider space (Calvo 4; Chappell, “Lowrider Cruising Spaces” 6-10). For example, laws have been put in place

to prohibit automobiles from being lowered below a certain height. These laws were designed to be a silver bullet to eliminate lowriders from the streets. However after dealing with colonization for hundreds of years, many indigenous peoples have become very savvy at survival and resistance. Chicanas/os are a group of people who know how to adapt. Unfortunately, according to critical theories of race, we live in a world where laws construct racism (Bell, "Racial Realism" 369-370). To protect Aztlán from these laws, "lowriders" innovated hydraulic systems that allow lowriders to be raised to the legal height during the presence of law enforcement authorities, and to be lowered down when the vehicle is safely beyond the range of police surveillance (Ides 158).

I am providing this brief analysis of lowriders to draw a more visceral argument of convergence culture between lowrider practices and digital media. I wonder if these best practices for lowriding hold any validity in cyberspace. I also wonder if the needs and desires that Chicanas/os express in physical spaces also exist in virtual space. After all, virtual space seems to reflect the realities of the physical world with uses of metaphor. For example, when I want to delete a file from my computer, I drag it to the trash or recycle bin ;-)

"Lowriders" are hackers who designed a tool (the lowrider) to alter normalized traffic behavior, which is heavily influenced by the speed limit. Altering traffic behavior is an indigenous act of colonial resistance, designed to transform western time/space to an indigenous time/place. Not only do the uses of lowriders have a purpose, but their construction does as well. Creating a lowrider is a ritual practice meant to bring families and community members together (Bright 587, 592-595, 601-602; Calvo 326-327;

Sandoval 26-28). During this ceremony finished and unfinished cars are driven, and they are shown off in parking lots and car shows.

During and after their construction, lowriders serve as a social networking technology that mediates social relationships and Chicana/o culture (Chappell, “Lowrider Cruising Spaces” 1-12). Lowrider space plays a role in distributing knowledge and humor, and it supports relationship building in Chicana/o communities. In lowrider space, Resolanas⁸⁰ occur, during which information is distributed. This information includes historical knowledge, memories, stories, political theories, spiritual knowledge, community news, and gossip. Throughout this paper I have wondered if Chicanas/os will perform digital media in a similar way. Perhaps this has already begun.

Today Chicanas/os not only have “lowriders” to look toward for inspiration, but also Chicana/o kids, adolescents, and young adults that grew up with digital media. These digital natives may already be demonstrating convergence culture. Like their ancestors, many Chicana/o digital natives are good with manipulating and implementing emerging technologies. It is critical for Chicanas/os to be aware of this, and to make intergenerational connections that allow elders and youth alike to share their stories about technology with each other. This is not to encourage youth to ape their elders, nor for youth to school their elders. I am advocating for an intergenerational knowledge

⁸⁰ The Resolana, a mestizo ceremony, is a traditional community gathering that takes place during New Mexico’s colder months. Atencio cites that during a Resolana people assemble on the south side of adobe structures as they reflect warmth from the winter-oriented sun shining from the south. During these gatherings, community members practice reflective dialogues based upon free association and community issues. The word “Resolana” means “place where the sun shines.” Revered Northern New Mexico Chicano elder, Tomas Atencio, uses resolana as a metaphor for enlightenment. It is an action taken by people to illuminate each other through dialogue (Montiel, Atencio, and Mares xi)

exchange concerning technology. This dialogue may illuminate for elders the cyclical movement of life where history repeats itself, and demonstrate to Chicana/o youth the importance of learning from the knowledge and wisdom of their elders. The purpose of this is to also bridge intergenerational gaps between elders and youth who grew up in radically different worlds. Repatriating elder roles in Chicana/o communities can provide support to Chicana/o youth, encouraging them to grow in their own unique ways while remaining mindful of where they come from.

When I think about lowrider and digital media convergence culture, I think about how online social networks in many ways attempt to function in the same way as lowrider space. Similar to the lowrider, online tools such as Facebook also work to mediate social networks and romantic relationships. Despite these similarities, online social networking operates in a cyberspace context, whereas lowriding supports social networking that operates in a physical context between people sharing co-located space. As a vision, I see lowrider space and cyberspace converging into indigenous re-imagined ceremony. Poetically speaking, I imagine Chicanas/os cruising their lowriders low and slow, operating as indigenous persons, on the information superhighway. I see them cruising this highway to build a new Aztlán for a digital age.

In this paper I have argued that the lowrider embodies the same innovation strategies required to advance digital media for Chicana/o self-determination. A Chicana/o and digital media convergence culture is never more important. Today, indigenous peoples face the influence of pervasive digital media by colonial and capitalistic institutions. For example, Native American media scholar, Antonio López

offers his testimony that within schools, governments and markets are leveraging the seductive power of pervasive media to assimilate indigenous youth (Kawagley 44, Lopez 116). At the same time this is happening, digital media theorists like Marshal McLuhan and Henry Jenkins remind us through, *The Medium is the Message* and *Convergence Culture*, that digital media provides people, not just institutions, with the ability to control media. Just like the lowrider is a tool to construct and broadcast messages out on the streets, it is also important for Chicanas/os to modify digital media to construct and broadcast their own meanings in cyberspace. To take this one final step further, I continue to wonder, how do Chicanas/os bring these two practices together to create something new?

CHAPTER 4

ENDIAN CODE WALKERS, A THEORY OF INDIGENOUS SOVEREIGNTY

Essay 4.1 – Through Salvage, Hacking, And Modifying

According to both amateurs and experts who study and/or operate upon the underlying structures of the Internet, the meaning of the word hacking is complex and contested. For these practitioners, hacking is often defined within a “good versus evil” paradigm. Although the binaries of good versus evil and the logic of true = 1 and false = 0 derive from historically related traditions, efforts to map good and evil in accordance with computational applications made of 1s and 0s becomes irrationally subjective within the context of cyberspace⁸¹ (Gunkel 815-816).

Despite the subjectivity associated with applying notions of “good versus evil” to the computational outcomes of binary code, both binary code and the binary “good versus evil” derive from connected Western scientific and religious traditions. Because the Internet originally derives from the contemporary cumulative knowledge of these traditions, it is no coincidence that both of these binary discourses are encoded into the fabric of cyberspace. On the Internet, as combinations of 1s and 0s lead to complexity, so do variously situated applications and perceptions of “good versus evil.”

The Internet is a contested space or battlefield occupied by about 3 billion people with varying interests, ideas, and motives (“Internet Usage Statistics”). Among these agents are hackers, some of who operate as individuals, while others work for institutions and corporations, or as part of online communities of interest. In terms of collaboration,

⁸¹ With vexing complexity, Internet scholar David J. Gunkel argues that the activity of hacking is the method for rationalizing and contesting the meaning of cyberspace (Gunkel 815-816).

hackers can accomplish goals in a variety of ways, including what is referred to as crowdsourcing. Within the collaborative process of crowdsourcing, hackers can amass and recruit each other online to create powerful sites of distributed cognition and distributed computation by pooling their collective resources for shared problem solving (Jenkins 26-31; 50-58; Mitnick and Simon 24). When hacker's actions are successful, meaning that they meet their goals of elegant design, they potentially increase the production speed, elegance, and effectiveness of their creations (Erickson 5-6). This also allows hackers to tackle challenges that are seemingly impossible for an individual to achieve alone. Despite the advantages of crowdsourcing, many hackers prefer to work alone for security reasons, and as lone wolves they are not to be underestimated: individual hackers have proven that, with resolve and patience, they can achieve the seemingly impossible (Schwartau 7-8, 37, 40).

Hackers reside throughout the globe, and they work for governments, corporations, and as I just mentioned they contribute to online communities of interest, and many operate alone. In terms of governments, organizations, and corporations, hackers work for security and intelligence agencies, terrorist organizations, organized crime, cyber security firms, military cyber war operations, activist organizations, software companies, institutions of higher learning, etc. (Mitnick and Simon; Schwartau 16, 33-49). Hackers are anyone of any sexual orientation, and hail from any social, political, economic, occupational, national, and cultural background imaginable. In other words, it is difficult to categorize hackers as a heterogeneous group (Schwartau 34).

Hackers are from every occupation and walk of life. Some hackers are artists, activists, politicians, lawyers, professors, militants, soldiers, engineers, hobbyists, entrepreneurs, learners, and even school children (Schwartau 14-16; Stover). They are geospatially distributed all around the world, with the ability to operate at varying levels on just about any part of the world from a fixed physical geospatial location within a given instant. This means that, within the domain of digital media, with a mobile connection hackers can also operate on cyberspace while on the move in physical space.

That hackers come from many backgrounds does not mean that the distribution of diversity within hacker communities represents a measure of social equity (Schwartau 36). Neither does it mean that these communities are actively doing work to broaden participation across diversity. Acknowledging the disparities across diversity within the hacker community at large, hackers are all ages, and they are operating with any manner of motives conceived within an unimaginable number of scenarios.

In our world hackers describe archetypes among themselves as those who mean to do good, those who mean to do harm, and those who are voyeurs and tricksters (Barber 15; Mitnick and Simon; Schwartau 6, 33-49). As I mentioned earlier, these labels are soft and often depend upon one's position within cyberspace. Regardless of archetypes, hackers are motivated by many different factors and are operating in many different contexts. Despite the endless possibilities, hackers are always operating within scenarios of contest, and sometimes hackers only enact these contests for self-satisfaction associated with achievement or for opportunities to compete for social equity by earning bragging rights (Bainbridge 237; Mitnick and Simon ix-x; Schwartau 37-38).

In terms of today's networked communication technologies, war is the genesis and nature of the Internet (Mitnick and Simon; Schwartau 19-24, 33-51, 408-418). By nature, I am not suggesting that the Internet itself possesses a warring instinct. Beyond humans, cyberspace is not a force nature (Lessig, *Code and Other Laws* 24-25). It is a human creation made possible by hardware, code, and human interaction. The Internet is a site of warfare because humans have built and chosen to enact it in this way. However, even though the Internet is architected by humans, it produces a contested cyberspace that mimics the evolutionary forces of nature (Erickson 4, 319-320). Without a reciprocal dialogue of destruction and reconstruction, the Internet would not advance and exist; just as in nature, without death and reproduction, life will not evolve and prevail. These binaries are an oversimplified way to illustrate that the Internet, like life, is a complex evolutionary system that adapts and changes. At the same time, concepts such as destruction and reconstruction remind us that binaries (of 1s and 0s) are the bedrock of the Internet and of all emerging digital technologies.

While defying unifying concepts such as media theorist Marshal McLuhan's "global village"⁸², the Internet's evolution is largely catalyzed by warfare and, therefore, shrouded by the fog of war (McLuhan and Fiore 66-67; Schwartau). The fog of war means that perceptions of "good versus evil" depend upon where one stands within cyberspace; within hacker paradigms of categorizing "good people" and "bad people," hacking is applied to justify and enact tactical positions driven by complicated motives.

⁸² Media theorist Marshal McLuhan coined the term "global village," to predict that people around the world become more tightly connected via electronic networked communications as a result of interdependence and diminished privacy (McLuhan and Fiore 63-67).

The fog of war also means that while a hacker may presume that he or she is doing something good, he or she might instead actually be achieving something to the contrary. Within stances or varying strategic combinations of offense and defense, hacking is used to accomplish everything imaginable within cyberspace, including resistance to global, cultural, and political heterogeneity.

Political and cultural resistance is exemplified by the civil disobedience activities of indigenous artists and militant hackers such as the artist-hacker collective Electronic Disturbance Theater (EDT). This group, in 1998, deployed the “Zapatista Floodnet,” which is a software tool they wrote to disable the Pentagon’s internal search engines (Schwartz 75-77, 375-376). EDT issued their attack as a way to raise awareness and call for action regarding a military standoff against the Zapatista National Liberation Army. EDT targeted the Pentagon because the standoff against the Zapatistas was a Mexican state military intervention against indigenous peoples that was monetarily supported by the US federal government (Raley 42-43). As a result of EDT’s actions, the Pentagon launched an online counter offensive to crash the EDT’s browsers, marking the first time that the Pentagon deployed military weapons against US civilians on American soil (Schwartz 75; 375-376).

Although describing the Internet as a place and process of war does not typically define popular consumer perceptions of cyberspace, underneath the surface there exists a lexicon of war deployed for a practice of engagement between adversaries. To describe this underworld the following terms are often used: firewall, anonymous, hacking, cyber security, intrusion, scam, fraud, access, “denial of service,” virus, defense, theft,

rebellion, spyware, activism, encryption, terrorism, control, malware, freedom, innovation, information warfare, surveillance, swarm, worm, knowledge, democracy, virus, etc. Although many of the words I have identified are associated by the status quo as having negative connotations, the concepts encoded in these terms point towards the existence of Internet tools that are used for any manner of purposes, both legal and illegal, within a battleground context. Whether hackers operate within or outside legal frameworks, the theories and methods for hacking remain the same for all types of activities (19).

Although I argued that the application of “good vs. evil” becomes irrationally subjective within the context of cyberspace, the diametric paradigm of “good versus evil” is a recurring refrain sung across literature about hacking, and by the hackers themselves (Erickson; Schwartau). In this refrain, hacking is described as an activity employed in the service of either good or evil, and the law definitely influences these perceptions; however, other complicating and extending influences also catalyze the actions of hackers, sometimes without regard for the law. Within cyberspace, hackers use slang such as “white hat hacker” referring to a guardian who is protecting the security of a system, and “black hat hacker” to describe someone who breaches the security of a system for malicious purposes (Barber 15-16; Schwartau 38-40). It may seem that the white hat hacker is good, and the black hat hacker is bad, however, the preceding paragraphs will illustrate how in cyberspace, perceptions of morality depend on context.

As within other scenarios of war, literature on the topic of hacking, which is a literature from multiple vantages, demonstrates that the perception of good and evil

depends upon one's perspective in accordance with where one stands within the Internet or battlefield, and this is often regardless of both domestic and international law.

Remember that, in the case of war, all sides usually cast themselves as good and their enemies as evil. Within various battles, actors determine both their defensive and offensive stances within this contest, as well as when to execute these stances.

Beyond the moral ambiguity expressed in uses of cyber war concepts such as "good versus evil," other relativistic dilemmas associated with the Internet are presupposed by famous postmodern theories such as Baudrillard's *Simulacrum and Simulation*. Despite indigenous critiques of postmodern theory,⁸³ Baudrillard's *Simulacrum and Simulation* becomes useful for unpacking the nature and implications of the Internet, and it provides a framework that pushes the activity of hacking as something far more complex than absolute and definable notions of good versus evil⁸⁴.

Instead of good and evil, the lens provided by Baudrillard enables us to see that the Internet is a dynamic and complex system that embodies the discursive and irreconcilable complexity of relativism. Another way to think about this is that a system like the Internet is built upon such great complexity that it is now mediating our

⁸³ Indigenous critiques of postmodern theory assert that the relativism that it espouses blurs indigenous identity, concepts of culture, and hierarchies of power that position indigenous identity (Grande "Red Pedagogy" 238).

⁸⁴ My intentions for evoking Baudrillard's theory are not to dispute or undermine indigenous critiques of Postmodern theory, but to produce more nuanced and non-binary understandings of the Internet and hacking. I argue that within the context of hyper-reality, a system that hails from western origins, Baudrillard's theories are useful for understanding the Internet. At the same time I agree with indigenous critiques of postmodernism, and I also argue that Baudrillard's theories do not respond to indigenous worldviews and knowledge systems. Indigenous education scholar Marie Batistte reminds us that indigenous knowledge systems have the capacity to benchmark the limitations of the western worldview (5). I argue that indigenous interactions with western theories extend indigenous knowledge regarding systems of power that are implicated in colonization. This knowledge is, of course, useful in determining strategies for indigenous self-determination and sovereignty.

perceptions of reality (*Simulacra* 1-42). Baudrillard argues that this hyperrealism, or “map,” has created a human disconnection to reality.

Perhaps an indigenous interpretation of Baudrillard’s arguments is that the disconnections to reality are in part manifested as our growing lack of a deeper awareness of our own bodies and relationships to the lands we inhabit. These are at least the resounding voices of elders from the region where I grew up, as they critique the younger generations of our communities. Baudrillard, in his famous text *Simulacra and Simulation*, argues that it is no longer possible for an individual and even groups of people to rationalize a unified theory of reality in a time of virtual reality. This is because the topography of the built environment, economic systems, and communication networks together supplant reality itself; all the while, Baudrillard suggests most of us are unaware of this circumstance.

I cite Baudrillard to introduce an important perspective: the Internet itself helps to define our perceptions of reality. In other words, the Internet is a component of a map, and as I have just stated, it is a map that Baudrillard argues has supplanted reality itself. According to this perspective, we are disconnected from reality, and it appears likely that perceptions of good versus evil are relativistic, especially within our maps of war. The Internet is yet another complex system within our universe and, like the cosmos itself, we as observers are limited by our capacities to see and understand it.

Within the operationalization of indigenous sovereignty via practices of cultural self-determination, rhetorical sovereignty, native sovereignty, and indigenous technological sovereignty, postmodern theories are useful in developing a critical

consciousness about the colonial implications of hyperrealism. As an individual, I cannot speak on behalf of indigenous populations or for humanity. Because I cannot speak on behalf of people, and do not possess universal answers to do so, I wonder if populations such as my mestizo community in New Mexico were to build the critical media literacies capacities to create a local indigenous critical consciousness about hyper-reality, would we agree that being disconnected from reality is a desired outcome for our survival?

It has been made resoundingly clear by indigenous scholars that place matters regarding knowledge systems, self-determination, and sovereignty both in accordance with many traditional and contemporary indigenous worldviews (Barnhardt and Kawagley 9-20; Basso 106-111; Battiste 13; Brayboy “Ethnography Forum;” Cajete, “The Struggle and Renaissance in Indigenous Knowledge” 87; Castagno and Brayboy 732, 737-739; Coffey and Tsosie 8; Kawagley 49-74; Oliveira 110-115; Wilkins and Lomawaima 68). In fact, according to indigenous scholarship and worldviews, for many indigenous groups relationships to lands and places often determine many local needs and desires. These relationships to land include the natural biomes that indigenous peoples inhabit, which are inextricably tied to what indigenous scholars Bryan Brayboy and Shawn Wilson refer to as local indigenous epistemologies, ontologies, and axiologies⁸⁵ (Brayboy “Ethnography Forum;” Wilson 33-34).

According to many indigenous traditions, people’s relationships to each other and the ongoing emergence of indigenous cultures depend upon deep relationships to land and an awareness of their own bodies within these relationships. The disconnections from

⁸⁵ Epistemologies – ways of knowing; Ontologies – ways of being; Axiologies – notions of beauty.

these realities, as theorized by Baudrillard, are antithetical to a large diversity of indigenous worldviews, and may be reason enough to consider Baudrillard and his contemporaries, especially because there are rapid and accelerating changes afoot that will only further entrench humanity within hyperrealism.

In almost all cases, the foreseeable changes associated with emerging pervasive media have the potential to disrupt and strengthen indigenous cultures. The outcomes for the future are largely dependent on the dynamism of indigenous forms of self-determination and sovereignty to adapt to the rapid changes mediated by emerging media and networked communications technologies. By adapting, I am not referring to assimilating towards, but instead to positioning the changes to come in ways that are culturally sensible.

Today's high-speed changes compel me to wonder how members of my community might adapt: Can we apply our indigenous knowledge systems in ways that allow us to both respond to these changes and remain emergent as indigenous peoples in accordance with our own traditions and self-determination? Baudrillard argues that we cannot; however, philosophical perspectives of indigenous sovereignty make it apparent that, although we can learn from Baudrillard, we cannot afford to be complacent with his perspective. This is because his theory about the world can only lead to nihilism (*Simulacra* 159-164). Unfortunately, colonization has produced enough nihilism in our world. During a time of climate change and increasing systems complexity and velocities, I argue that all of us humans cannot afford to accept more nihilism. Perhaps a way forward, assuming the possibility that there is some truth to Baudrillard's theory, is for us

all to hack the maps of hyper-reality to, at the very least, create our own self-determined alternative realities.

My intentions for evoking Baudrillard's theory are to produce more nuanced and non-binary understandings of the Internet and hacking, which, within spheres of cyberspace, appears to be many things to many different people. Working under the idealistic assumption that all who engage with the Internet are stakeholders of cyberspace, I will identify a theory and practice of indigenous hacking that may be of use for the exercise of indigenous self-determination and sovereignty within the context of the digital age. My motives for presenting indigenous theories, praxes, and examples of indigenous hacking are to support indigenous action in occupying a rightful place, on indigenous terms, within our global digital commons⁸⁶. This is universally important because broadening participation is a useful strategy for building global equity.

The theories and praxes of hacking that I will identify are the outcomes of traditions that descend from centuries of indigenous pragmatism, innovation, and aesthetic creativity: as indigenous resistance to colonization; to survive colonization; and to be resourceful despite the disparities created by colonization (Kawagley; Martinussen; Müller, "An Other Path; Müller, "Making Ends Meet;" Nango and Thoresen; Oskal; H. Smith; Ybarra-Fraustro;). Before I identify and explicate this specific thread of indigenous hacking, as well as argue why I think that its practice and evolution operationalizes Indigenous Technological Sovereignty, I will first attempt to provide

⁸⁶ Many Internet servers reside upon the sacred ancestral lands of indigenous peoples, making it an appropriate exercise of indigenous self-determination and sovereignty for indigenous peoples to claim their digital commons on the Internet.

more specific definitions of hacking now that I have established a lens through which to view the Internet and the diverse identities of hackers.

Moving forward, I will offer multiple definitions of hacker/hacking based upon rival moral and ethical perspectives. To provide multiple definitions, I will extend the discourse of binary notions of “good versus evil” in relation to hacking. However, in accordance with Baudrillard’s theory, I will not do so without situating morality and ethics within varying scenarios that circulate rival perspectives of what good and evil are. In my efforts to illustrate some of the complexities of hacking, I will present a series of narrative scenarios, starting with one that defines the most popular perception of hacking.

To get started, let’s imagine that you represent your own cyber security firm, and a corporation or government has hired you as a consultant. In this scenario you are contracted to help establish the security of your client’s online assets. To perform this job you are being paid by your client to think of hacking as a criminal activity. As an actor of defense within a sphere of war, your job requires that you cast yourself as an ethical person working to protect your client from the immoral forces or “bad guys” attempting to hack into your client’s secured digital property.

In this scenario, hacking is defined as the unlawful breaking and entering into secured digital spaces for the purposes of viewing, vandalizing, and/or stealing private digital property usually classified as sensitive digital information (Bainbridge 237-238, 244-245; Mitnick and Simon; Schwartau 19-52). This scenario also includes the unlawful breaking and entering into secured digital systems for the purposes of hijacking digital

and physical systems⁸⁷. This is the basic definition of hacking that has been popularized by mass media. However, this definition does not tell the whole story, and a discussion of its limitations will unfold throughout this essay.

Stealing or operating on secured information located on the Internet usually empowers some sort of tactical advantage for the hacker. Depending on the motives of the intruder (a hacker) and the systems of power within which she or he is working, the operations of intrusion will have varying implications and consequences. For example, a hacker of lower socio-economic status, with access to an Internet connection, a laptop, and the right know-how, can suddenly become more powerful than the CEO of a major commercial bank. This occurs once this hacker has anonymously commandeered control of this same commercial bank's assets.

As hackers break into systems, it becomes possible to imagine the implications when, for example, they access government top secret information or consumer credit card information, or when they seize control over bank accounts; a soda pop vending machine; a communications satellite interface; a video poker machine; aircraft systems; or even weapons systems such as an armed drone or nuclear weapon; (Mitnick and Simon 1-46, 250; Schwartau 432-437). Of course, let's not forget about when hackers retrieve and publically post a private video featuring taboo sexual fetishes or a sexually provocative nude photo of an important dignitary or one particularly famous celebrity.

To extend the popular definition of hacking, as described in the previous paragraphs, hacking is not only accessing and viewing or manipulating secured valuable

⁸⁷ Like a power plant or financial system.

digital media; it is also referred to by hackers as the processes or art of breaching secured Internet locations, as well as concealing one's tracks (Erickson 319-321). Within the context of breaching security to gain access to secured Internet locations, hacking is always achieved by exploiting structural weaknesses within systems, which are sometimes designed to protect private digital media (115-193). Within hacking communities, like many engineers, the goal is to solve problems as elegantly and artfully as possible (1-3). These same concepts are not only limited to the Internet, but also apply to physical reality as well.

Let's now change the scenario and imagine that, perhaps in a different cyber-security contract, your firm is protecting the interests of a client operating within the e-commerce sector. Within this scenario, in addition to protecting the identification and credit card information of your client's customers from identity theft, you are tasked with defending your client from another type of hacking. Before I illustrate this other type of hacking, here is some context to consider: According to a recent report by the *Wall Street Journal*, e-commerce giant Amazon lost an estimated 1 million dollars an hour in sales due to outages of Amazon's web portal (Bialik). Keep in mind that the purpose of this *Wall Street Journal* article is to stress that these estimates are speculative.

The article supports the case of some analysts who believe that, if the website is down, customers will return at a later time to take advantages of the benefits of shopping at Amazon (Bialik). However, these analysts also concede that outages require money for repairs, revenue from impulse shoppers is lost, and customer retention could decrease if Amazon's web portal is unreliable. Looking at all of the speculations and analyses that

try to account for Amazon's losses, and the fact that many of these point to website outages, it becomes very clear that it is much more than your client's private corporate information that must be protected.

In the cases where your client's revenue is dependent upon a hugely sophisticated computational engine enabling a global virtual shopping center to operate on the Internet, it behooves your client to protect itself against the same forces that exist in the physical world. For example, corporations that have shopping centers on the street do their best to secure their businesses from vandalism, sabotage, intrusion, and theft. As I mentioned earlier as a reciprocal, many things that apply in physical space also apply in cyberspace.

On the Internet there are the "Good, Bad, and the Ugly"⁸⁸, and as far as your clients in e-commerce are concerned protection against what they view as the forces of evil is of paramount importance. In the case of a major retailer such as Amazon disruption of its computational engine causes significant revenue losses. Even if the system is simply shut down for a few minutes, this time lost will eventually equal large aggregate losses in revenue. In e-commerce, the saying "time is money" is really more than just a metaphor (Lakoff and Johnson).

As a cyber security consultant, protecting the integrity of your client's website leads us to one of the greatest challenges of computer science, which is to figure out how to mitigate what is referred to as the "denial of service" attack. In a "denial of service" attack, a hacker can overwhelm an Internet server with so many download requests that the server's information pipeline gets clogged (Schwartau 279-283). In other words the

⁸⁸ Spaghetti western. The Internet is a new frontier, the wild wild west. And like the spaghetti western there are no Indians included in the narrative.

requests for information at a given time exceed the pipeline's bandwidth to respond to the demand or number of requests. When this happens, the server can do nothing more than cease to respond, or what many refer to as "crash." This is not unlike what happens at rush hour in Los Angeles when the number of cars exceeds the highway system's capacity to support the smooth flow of traffic and, as a result, a traffic jam occurs.

When a traffic jam is aimed at an Internet server, all of the websites on this server go down, and for the time they are down visitors to these websites experience a "denial of service": "Come back later because the website is down." During a short time, the disruption of commerce, via a "denial of service" attack, is staggering.

Imagine the transformational possibilities that "denial of service" attacks can enact through every system imaginable that is connected to the Internet, including those that are connected to physical machines and robots. What's interesting about hackers shutting down the operations of a multi-billion dollar corporation is the idea that the hacker or group of hackers may simply be retaliating for bad experiences they had with its customer service department. According to hacker and cyber security expert Winn Schwartau, it is not always easy to discern who is responsible for a particular security breach because there are many effective ways for hackers to establish their anonymity on the Internet (155-163; 325-335). As far as customer service goes, these retaliations could be coming from a child who was sent the wrong video game at twice the price.

Up to this point everything I have presented comes from hypothetical scenarios that you as a cyber security consultant face when protecting your client against the forces of the evil. Before I flip the script, I will present one more example of hacking from your

hypothetical perspective as a cyber security contractor. Imagine that business is good, and in addition to the previously discussed contracts you also consult for a software development company. In this case the software company has asked you to identify security weaknesses in their software. The particular security weaknesses that you have been asked to address are those that might allow the opportunity for a customer's computer to contract a computer virus. The key characteristic of all viruses, whether in nature or within digitally networked systems, is that they replicate (212). The properties of replication are what make highly contagious viruses particularly effective at overwhelming the health of computers, as well as proliferating systems on a massive scale as they spread throughout the Internet.

The issue with computer viruses is that they travel across the Internet and through other media like thumb drives, and can infect a computer through processes of downloading information (Schwartau 212-228; Zetter). In all cases, computers become infected when computer users unwittingly download viruses. When this happens, viruses replicate within the infected computer until they eventually overrun the computer's systems, often causing damage to digital information, computer hardware, and other physical hardware connected to computer and communications systems.

Viruses are capable of doing more than just destroying or disrupting a computer's routines; they can also work as tools for spying (Mitnick and Simon; Schwartau; Zetter). These particular tools, also known as spyware, can propagate throughout the Internet and report information back to a hacker, such as an unsuspecting user's keystrokes that include usernames and passwords. The issue with these types of viruses is that they can

be difficult to detect. Here again, from your perspective as a consultant, and from the perspective of your client, these actions by hackers are evil, or “malicious,” as commonly described by hackers themselves.

Now that I have surveyed the field of hacking from the perspective of cyber security, I am going to work backwards while also flipping the script. Keep in mind that this survey of hacking uses oppositional perspectives to demonstrate how the Internet is a contested space. At the same time, there are limitations to building complexity through these oppositional arguments. Because of this limitation, please keep in mind that the Internet is a complex system, and we as observers are limited by our capacities to see and understand it, regardless of the various frameworks we apply in our attempts to do so.

From the cyber security perspective, hackers who write and deploy viruses that destroy computers are often thought of as evil or malevolent. The twist in all of the aforementioned scenarios is that your role as a cyber security consultant requires you to be a hacker yourself! The only way you can understand where to strengthen your client’s online systems is to hack them (Schwartau 10, 315-324). The only way you can understand if the security systems you have implemented for your clients are effective is to try to hack these systems as well. It’s better for your own company’s hackers to identify security weaknesses rather than for other hackers who might have bad intentions.

Now keep in mind that although you hypothetically represent your own cyber security firm, in an alternate reality you might just be an independent hacker, responding to a call from a corporation inviting you to hack one of their systems (41, 315-324). This

request seems odd, but it does happen. When corporations invite⁸⁹ hackers to identify vulnerabilities in their systems, their intentions are to leverage hacker labor for cyber security purposes. The corporation rewards a hacker for vulnerabilities that are exploited when he/she collects what is referred to as “bug bounties” (Shahani, “When Hackers Shahani;” Arti, “Banks Reluctant To Use ‘White Hat’ Hackers”). As you might imagine this is a delicate dance between hackers and corporations because hackers have a large degree of bargaining power when they collect their bug bounties, because, at the time of collection, they hold keys to a corporate system (Schwartau 315-324). Both sides must be fair and diplomatic in order to prevent cyber conflicts and the exploitation of highly skilled labor from occurring.

So far I have illustrated that both guardians of and those who breach systems are hackers. In the cases presented thus far, from the perspective of corporations, the guardians or “white hat” hackers are “good,” and those “black hat” hackers who breach their security are “evil.” However, as we will see in the following paragraphs, the script of “good” and “evil” can be flipped, as the previously identified “black hat” hackers seem to be on the side of “good” as they identify and retaliate against the violence capitalism of corporations, which includes activities such as destructive environmental practices, information gate keeping, hijacking local food sources and economic systems from

⁸⁹ Sometimes there are also hackers who will try to help corporations without being invited from corporations. These hackers will break into systems and then anonymously report the vulnerabilities to the organization’s who’s systems they hacked. Although these “Robin Hood hackers” are well intended, they are still prosecuted by the law if caught (Lessig, *Code and Other Laws* 194; Mitnick and Simon 91-113). These hackers usually notify the organization’s they hack by entering into secured spaces; take a look around out of curiosity and to learn about a system; and leave a notification behind to let the organization know that their digital space was hacked.

indigenous peoples, the maltreatment of labor forces, paramilitary operations deployed to destabilize regions for the creation of economic opportunities, censorship, and so on.

When wrapping back to the topic of viruses, the perceptions of malevolence associated with computer viruses also becomes ambiguous when your own government's hackers employ them for the purposes of national defense. One famous example a worm called Stuxnet, which experts believe to be a U.S. government sponsored computer virus, was released to cripple Iran's alleged production of weapons grade uranium (Kushner; Rosenbaum; Sanger; Zetter). This virus was allegedly used to both spy on Iran while also causing the nation's uranium centrifuge machines to self-destruct.

Over time, cyber warfare between nations has increased, and in October 2012 the former United States Defense Secretary, Leon Panetta, has warned America that it is vulnerable to attacks that could paralyze the flow of water, cripple power grids, crash transportation systems, and destroy economies (Bumiller and Shanker; Crawford). All of these possibilities are being tested everyday by adversarial nations via the Internet while you and other consumers around the world are shopping at Amazon. The fact that modern warfare is often covert, even within public spaces like the Internet is consistent with a theories of speed, which suggest that as the velocity of technology increases over time, so does the invisibility of weapons (Virilio, *Speed and Politics* 149-167).

Since 2012 the Director of the United States National Security Agency and head of U.S. Cyber Command Admiral Michael Rogers recently testified before the House Intelligence committee in November 2014 that China and possibly a couple of additional countries (whose identities are classified) have the full capacity to control utility systems

in the United States (Gorman). This capacity includes the ability of these nations to shut down systems that facilitate power generation, and the movement of resources across the nation, such as water and fuel. According to Rogers, the U.S. is monitoring aggressive attempts by other nations to exploit vulnerabilities in U.S. cyber systems. Rogers also stated that these activities signal future trends and are largely driven by espionage.

In the U.S., evidence of Rogers' predictions are now becoming more salient within the popular consciousness as hackers allegedly originating from North Korea have been declared responsible, by United States government agencies, for hacking Sony pictures — a Japanese Corporation operating in the United States (Carr; "The Interview"). Retaliating against a movie titled "The Interview," which contains a plot to assassinate North Korean leader Kim Jong Un, an angrily offended hacker group who refer to themselves as the "Guardians of Peace" hacked the movie's producer and distributor, Sony Pictures. The hacker group seized control of Sony's digital assets and began to publically release these assets, which includes customer identity, financial account information, embarrassing private information, and high value entertainment assets such as movie screenplays for future productions (Carr; "The Interview").

Reacting to both the movie plot and claims by the United States that the hackers are from North Korea, the North Korean government has released threatening war rhetoric against the United States (Carr; "The Interview"). Meanwhile, the "Guardians of Peace, who have taken credit for the cyber attacks on Sony, have threatened to release more of Sony's assets as well as to engage in acts of violent terrorism against U.S. citizens should *The Interview* be distributed and screened (Carr). These actions have led

movie theaters throughout the United States to cancel screenings of *The Interview*, forcing Sony to rethink the movie's distribution (Carr; "The Interview"). These actions by hackers, whether independent or government sponsored, have created sentiments in the United States that U.S. freedom of speech is under attack; and that U.S. freedom of speech or creative freedom has been effectively silenced by a foreign power.

In the U.S., actions by the "Guardians of Peace" to cripple distributions and screenings of *The Interview* have generated political bi-partisan debates as to whether the nature of the attack was vandalism or warfare. The implications of these debates again illustrate the moral ambiguity of good vs. evil as U.S. Senator John McCain in a CNN opinion editorial wrote, "These ruthless cyberattacks damaged a company's [Sony's] reputation, opened the door to uncertain legal liabilities, and made light of our nation's copyright and intellectual property laws. They shattered any notion we may have had about our personal data and private communications remaining private" (n. pag.).

In his statements, Senator McCain uses the "we" in his statements to construct a sympathetic audience. McCain uses the rhetoric of "we" to produce citizen support and a belief that "The Guardians of Peace," are responsible for compromising the privacy of U.S. citizens. However, the once publically unknown surveillance operations of the U.S. government's National Security Agency additionally "shattered any notion we may have had about our personal data and private communications remaining private" (McCain n. pag.). Even before acquiring knowledge of the NSA's surveillance programs, the public was becoming increasingly aware of surveillance activities by major corporations. It is likely that unregulated corporate practices of collecting and trading information about

consumers also “shattered any notion we may have had about our personal data and private communications remaining private” (McCain n. pag.).

In early June 2013, the security contractor Eric Snowden leaked US government classified information about its global surveillance programs after having worked inside the NSA (“Edward Snowden: the whistleblower;” “Edward Snowden and the NSA”). Snowden’s revelations about the NSA’s unobstructed ability to hack, without restrictions and with high granularity, the privacy of its own citizens as part of U.S. government sponsored surveillance programs has with certainty “shattered” any notion that “we” may have had about “our” privacy (“NSA collecting phone records;” “Verizon forced to hand over telephone data”). Interestingly, as politicians often do, the senator irreverently contradicts himself as a staunch supporter of the aforementioned surveillance programs by the U.S. Government to surveillance its own citizens.

To make matters even more vexing, it is interesting to imagine what McCain’s response, a supporter of big budget national defense, may have been if the script was flipped, and North Korean artists produced a big budget popular movie for global distribution, whose satirical plot was about the assassination of the President of the United States. The United States has strict laws against any threats to the presidency, and may even perceive a widely distributed popular entertainment satire as a threat if it originates from an alarming enemy state. This is because in our mass mediated world, the political implications of all literacies supported by big dollars, including those that are satirical, produce highly distributed, influential, and consequential rhetoric that cannot be

simply be engaged as a local issue when it proliferates all kinds of international political and cultural contexts (Lessig, *Code and Other Laws* 205).

Perhaps free speech must be accountable in a world by which such freedoms most certainly have consequences and/or limitations in an internationally shared cyber world where physical borders cannot protect national values. To the degree by which online coded architectures regulate human behavior, we now exist in a world where cyberspace is internationally sovereign onto itself (192, 198-199, 205-206). The sovereignty of cyberspace now competes with other forms of sovereignty such as what is operationalized by the U.S. constitution. What is interesting about the sovereignty of cyberspace is that it is not evoked by international law and policy, but by the architects of the Internet, or computer programmers, whose computer codes influence and regulate human behaviors (20-21, 207, 232-233).

Getting back to Senator McCain, to be fair, we must take context into consideration when critiquing his rhetoric. Although the activities of the “Guardians of Peace” and the NSA are both part of cyber warfare, McCain is on one hand responding to what he feels is a warring transgression toward the United States by an adversarial nation, while on the other hand he is responding to Snowden’s revelations as he tries to justify to the American people why he thinks, for the purposes of national security, citizens should willingly hand their personal privacy over to their government. In the case of North Korea, the U.S. government has promised to respond proportionally to the transgressions by North Korean hackers, and through this response a chain reaction of events continues to unfold in cyberspace (Liebelson).

The invisibility of cyber weapons by hackers often makes it difficult to detect who is responsible for their deployment (Erickson 319-321; Schwartau 19, 40, 325-335). Although the United States claims that it knows for sure that the North Korean government is responsible for hacking Sony, cyber security analysts have pointed to evidence that former employees of Sony were involved (Liebelson). According to these experts, it is difficult to know exactly who was responsible. It is entirely possible that the hackers who broke into Sony could have been individuals acting independently of government. If this is the case, not only was Sony's distribution strategy disrupted by cyber attacks, but the actions of this handful of hackers have thrown adversarial nations into a diplomatic tailspin as both try to maneuver each other's rhetoric and save face. The danger with some hackers is that they are sometimes individual ideological agents or small groups of agents who take it upon themselves to operate outside of consensus building forms of governance and diplomacy. This means that a hacker or small collective acting according to its individual ideas of what is right for the world could non-diplomatically engage the world in ways that ruin lives for a majority of people whose values do not accord with those of the hackers.

In all cases, regardless of contradictions, dilemmas, and good vs. evil, one thing is clear, whether it is the activities of the U.S. government against another nation, the activities of an independent hacker group, or any government hacking the privacy of its own citizens, or any of the other hacker scenarios presented in this chapter, all of these activities are happening subsequent to an anticipatory report released on October 29, 2014 by the Pew Research Internet Project titled "Cyber Attacks Likely to Increase."

Within this report, authors Rainie, Anderson, and Connolly reveal that 61% of 1,642 respondents surveyed believe a major cyber attack will occur by 2025 that will cause major financial losses or loss of life. Within this same report, former counsel to the NSA Joel Brenner is quoted from the Wall Street Journal as having stated that “The Internet was not built for security, yet we have made it the backbone of virtually all private-sector and government operations, as well as communications” (n. pag.). The analysis by Brenner that the Internet is not secure reveals one of the core reasons why cyberspace has become a tool and place of war.

According to hackers, computer hacking wasn’t always so warring and malicious. Early in its history a large part of hacking was about pulling pranks and creating what is referred to as “cybergraffiti” (Lessig, *Code and Other Laws* 194; Schwartau 25-32). For example, a hacker might break into a movie production company’s website and replace its upcoming movie advertisement with a spoof advertisement (Mitnick and Simon 248-250). Sometimes cybergraffiti is so clever that it’s even better than the messages it replaces or spoofs⁹⁰.

Beyond “cybergraffiti,” hacking was largely driven by ethics of curiosity among communities of computer programmers who were curious about the way things work (Barber; Erickson; Gunkel; Mitnick and Simon; Schwartau). Many hackers continue this tradition today. To these hackers, the Internet is a laboratory or place of inquiry, and they wander through cyberspace observing. This is a part of how computer science maintains its knowledge of computer systems. To these types of hackers, the art of hacking is

⁹⁰ Google Star Wars Phantom editor.

purely aesthetic (Best 7-9). It's about writing elegant codes that expose weaknesses in systems. These ethical artists (or voyeurs) have been known to explore "secured" locations without causing any damage or disruption (Lessig, *Code and Other Laws* 194). There is a practice that has been about anonymously notifying whom ever it concerns of security weaknesses.

There was a time when hacking was largely an artist's and prankster's endeavor. This was in the early stages of the Internet, which was built upon the idealisms of its founders to be a place of non-discriminating civic participation for the freedom and free flow of information (McChesney 75). Over time the Internet was proliferated by corporate interests (75-79). With rising cyber capitalism at stake, governments in their efforts to protect the security of market systems began to legislate laws criminalizing the activities of these artists and tricksters (Lessig, *Code and Other Laws* 194-196).

Since their interventions and sponsored innovations, governments have tried to regulate the Internet as if it were acting in physical spaces (it has been involved in territorializing and militarizing the Internet), and corporations have invested in cyberspace as if it were physical real estate (McChesney). The outcomes of these activities have now presented competing public ideological adversaries, corporations, and nation-states with potential targets for assault and protection. These hackers could be coming from just about anywhere imaginable, they might be individuals acting alone, or they might be a government-sponsored cyber-army.

Today all things Internet are subject to a world of war and terrorism, which is a claim supported by the former U.S. Secretary of Defense who has recently warned

America that it might one day suffer the consequences of a “cyber Pearl Harbor” (Bumiller and Shanker)! In cases of national security, government hackers probably see themselves as on the side of “good,” and their enemies as “evil.” We live in a world where the construction and deployment of viruses, in the context of international war, becomes something that is moral and ethical when deployed in the interests of national defense, but again, in the fog of war morals and ethics are often largely ambiguous.

In addition to international warfare, there are other spaces of context such as those defined by government politics, corporate activities, and activism. In these contexts, the hacker concept of the “denial of service” attack becomes an instrument of protest that is tied to “good” causes if you are the protester. On the Internet, “denial of service” is sometimes employed for civil disobedience protests. “Denial of service” is also a concept employed on the streets. Within the tactics of activism, “denial of service” on the Internet is similar to occupying a street or some other space. The function of this tactic is to impede some sort of access, whether this be online or in the physical world.

There are examples of activism such as when environmentalists chain themselves to trees in order to prevent or delay a lumber company from cutting down parts of a forest. Within cyberspace these same tactics can be applied when environmentalist hackers disable a lumber company’s computer operations that also prevent or delay the company’s objectives. Like the work of Electronic Disturbance Theater cited earlier, Hacktivism is the use of hacking for activist purposes, and civil disobedience is enacted online via hacking as a method of protest.

In terms of the most popular definition of hacking, which is associated with unlawful breaking and entering, let's consider a story that took place not too long ago. This case is not hypothetical, but an event that actually occurred. Unfortunately this particular story of hacking led to the tragic suicide of the hacker, who was considered by the technology industry as an Internet legend for his work in producing influential tools for sharing information, which greatly expanded the functionality of the Internet.

That the following scenario ends in tragedy is significant and worth discussing, especially because the hacker, despite the fact that he was charged with felony hacking, sincerely believed that he was doing the work of "good." His sincerity is significant not only because he took his life on account of it, but also because a significant portion of the online public agreed with his perspective. Furthermore, the institute he hacked chose to evaluate those of its policies that he critiqued through hacking.

On Friday, January the 6th, 2013, software engineer, political organizer, hacker and activist Aaron Swartz took his own life shortly after pleading not guilty to two counts of wire fraud and eleven violations of the Computer Fraud and Abuse Act ("Internet Hall of Fame Innovator;" Scheiber; Schwartz). After declining a plea bargain, Swartz issued a counteroffer to the courts, which was rejected. Two days later, Swartz committed suicide.

In order to understand how this instance of hacking led to tragedy, we must first acknowledge Swartz' background. Aaron Swartz was in many ways an exceptional hacker. He was a research fellow at Harvard University's Edmond J. Safra Center for Ethics, where he worked to understand and remedy various forms of institutional corruption at different sites within government and the public ("Internet Hall of Fame

Innovator;” Schwartz). In addition to his work at Harvard, Swartz co-founded Creative Commons, an organization that according to its website, “. . . develops, supports, and stewards legal and technical infrastructure that maximizes digital creativity, sharing, and innovation” (“Creative Commons” n. pag.). Creative Commons has been largely responsible for creating legal national and international frameworks by which to freely share information online. Among many other accomplishments, Swartz co-authored RSS to enable web syndication, making it possible for websites to distribute information to each other for real time display (Bombardieri; “Internet Hall of Fame Innovator;” Schwartz). He also developed tools for Reddit, an information-sharing site, allowing millions of users to share news and information with each other across the Internet.

Swartz’ activities clearly reflect his passion for the massive distribution of free information promoting civic participation, which largely occurs through online participatory culture. Swartz’ and many hacker’s vision for the Internet is one of creative commons where knowledge is controlled by the public and flows freely without borders, an Internet where all its users have equal access to knowledge (McChesney 75-76, 78).

As part of his many contributions toward making this vision a reality, Swartz created online tools, shepherded legal frameworks, launched political campaigns against Internet censorship bills, organized congressional political campaigns, produced academic scholarship, and he hacked MIT’s online journal archive called *JOSTR* (Bombardieri; Schwartz; Scheiber). The latter was a legal transgression that would eventually end with the tragic death of this Internet pioneer. The same year of his death, Swartz was inducted into the Internet Hall of Fame.

The reason Swartz moved from working within legal channels as a hacker to taking illegal action might have been driven by his idealistic beliefs that information should flow freely across the Internet. In “Guerilla Open Access Manifesto,” Swartz refers to the power of knowledge and his perception that it is immoral and ethically wrong for anyone to keep knowledge from others (Bombardieri; Scheiber). This appears to be one of Swartz’ motives for hacking MIT’s *JSTOR*. Swartz was methodically downloading a significant portion of *JSTOR* academic journal archive, possibly with the intention of freely distributing these journals throughout the Internet. In the case of *JOSTR* and other academic archives and publishers require subscribers to pay excessively high fees in order for users to have access to academic archives (Scheiber; Schwartz). In many cases, academic institutions, some of which provide public access, pay these fees. However, *JSTOR*, which contains almost all of the scholarly articles in the social sciences and the humanities written in the 20th and first part of the 21st century is mostly not accessible to the public (Scheiber).

Not only do many activist-scholars see this kind of knowledge capitalism as an assault on open public access to scholarship, but they also highlight that it impedes the growth of academic institutions and governments in developing nations, for whom it is not always possible to afford costly access fees (Scheiber). Swartz’ concerns were about leveraging the power of the Internet to build equity in the world. To Swartz, knowledge equals power, and his mission was to contribute work capable of mitigating global inequities of power. The ethics of hacking for Swartz and other hacktivists involved in freedom of information is described by hacker and author Jon Erickson as “. . . the

appreciation of logic as an art form and the promotion of the free flow of information, surmounting conventional boundaries and restrictions for the simple goal of better understanding the world” (2-3). It is possible, given Swartz’ social justice idealisms and accomplishments, that if he was of sound mental health he was willing to apply the hacker ethic described by Erickson to go as far as hacking, appropriating, and potentially redistributing academic knowledge for free, in an effort to take a stance on his views of constructing a more equitable world. This was the motive and plan that was disclosed by the US district attorneys office, which was in charge of prosecuting Swartz (Scheiber).

This case provides an example of why the binary “good vs. evil” is used by hackers, as it illustrates how the Internet is a place of warfare. At the same time, it also demonstrates how moral ambiguities arise as part of hacking. In other words, as I have argued before, perceptions of morals and ethics become distorted and relative. This “latent ambiguity” becomes compounded by legal systems, which are slow to respond to the architectures of today’s technologies, both because of the speed and spatial ambiguities these technologies produce (Lessig, *Code and Other Laws* 22-23, 109-110, 149-150, 191, 211-221).

Although Swartz’ activities suggest he was motivated by a quest for social justice and the freedom of information for all, he was going to be punished by the law, and additionally might have had to defend himself against legal actions taken by MIT for having hacked *JSTOR*. There is something quite morally ambiguous about this particular scenario; at the same time, the law appears unable to sort through this ambiguity rationally. What’s interesting about this case is that after Swartz’ death, MIT released a

report that they did not seek federal prosecution, and that in light of Swartz' activities the institution is interested in addressing several policy issues that were raised by Swartz' hacktivism, which was probably Swartz' intended outcome (Schwartz).

Another complex scenario of interest is a phenomenon that has been occurring in elementary, middle, and high schools, where students have been hacking into their schools' computer systems (Boyle III 2, 4, 22, 25, 34; Stover). In the cases of these school hackers, some have been motivated by the challenge of hacking their school, while others have used the opportunity to manipulate data, such as alter grades, or steal confidential information about their peers or faculty. According to an article published by the Education Digest in 2005, many of these students have faced felony charges and schools have reacted by placing tougher rules and security systems in place (Stover). Unfortunately, these cyber laws do not account for what ethics scholars Dudek and Johnson cite as common student practices, which are to “. . . challenge hierarchical notions of power, external restrictions, and authority imposed by social institutions” (185). In many ways, these common student practices also seem to reflect common democratic processes, which are the same processes that inspire civic participants such as Swartz to take action.

Because student hackers are not acknowledged as children, but instead as alleged criminals, Del Stover, Assistant Editor of School Board News, refers to cyber security expert Steven Miller who explains that schools tend to think of solutions such as security measures that are analogous to metal detectors: referring to surveillance (56). These security measures include increased password protection, tougher rules, student

expulsion, and new firewalls. Miller connects with the idea of social justice, suggested by Dudek and Johnson, in that he doesn't think these brute force security measures work as well as collaborating with students to address the issues (56). Miller claims that students are much more likely to follow the rules if they are treated as stakeholders with opportunities to help define the rules. Digital Citizenship scholar Clifton J. Boyle III agrees with Miller in that, rather than designing punishments, perhaps schools should seize the opportunity to embrace students' computer literacies skills by contextualizing these skills within frameworks for the ethical and responsible use of technology, also referred to as "technoethics" (4-11).

Both, scholars, Boyle III and Stover recommend that schools teach digital literacies, cyber law, social justice, and computer ethics. Although these scholars present a negative interpretation of hacking, digital-literacies are complicated by curriculums that explicitly include hacking as an essential part of digital media and learning. Hacking is an indispensable aspect of digital media and learning because the acquisition of digital literacies requires students to reverse engineer and evaluate systems in order to troubleshoot-fix, or modify-improve, or modify-reimagine them. This digital media learning may be needed now more than ever, since students are aware that, as a result of Edward Snowden's disclosures of U.S. global surveillance programs, the National Security Agency is hacking away at their privacy and the privacy of their fellow citizens. In this scenario we again see moral ambiguity as student hackers suffer harsh legal punishments for peering into the private information of others, while the government and corporations are doing the same unto them without legal restrictions or consequences.

Drawing from Bourdieu's theory of "Acts of Resistance," Dudek and Johnson analyze fiction by hackers in order to uncover hacker ethics. These researchers provide an analysis that shows how, in a couple of case studies, hackers use fiction to encourage their readers to apply technology and hacking for the purposes of social justice (184-185). Dudek and Johnson's aim is to complicate negative criticism regarding children's behaviors in cyberspace, by arguing the possibilities for how youth feel empowered by their ability to use their digital literacies skills. These researchers highlight how fiction appeals to youth to use their digital literacy skills to enact social justice (184-195).

Analyzing the novel *Little Brother* by Corey Doctorow, Dudek and Johnson conclude that the author-hacker is suggesting that governments and corporations do not have the right to survey and mine the private lives of individuals (194). Furthermore, the author is arguing that this type of activity is an assault on individual privacy, and that it constrains the public's collective freedom. Dudek and Johnson's analysis of this work of fiction also suggests that the author is arguing that, as long as people's privacy rights are abused, "... hackers and other technological experts will find ways to subvert these restrictions and to share these acts of resistance with others to empower them" (194). Dudek and Johnson also conclude that, as long as hackers assert their power, the ethics of their actions will continue to be debated.

The message of Doctorow's fiction clearly reflects the beliefs and actions of Edward Snowden. In addition to Snowden, it also reflects the ethical positions of the Electronic Disturbance Theater, famous hacker groups such as Anonymous, and of course Aaron Swartz. This sector of the hacker community has informed the public that

the government and corporations have assaulted individual privacy by weaponizing the Internet as a tool for high-resolution global surveillance.

According to the information distributed by these hackers, the Internet has been successfully hacked and re-imagined to reflect Michel Foucault's idea of the Panopticon. The information disclosed by Snowden demonstrates that corporate and government capacities for surveillance now have the potential to capture the private information of all Internet stakeholders, meaning all human beings who are online ("Edward Snowden: the whistleblower;" "Edward Snowden and the NSA;" "NSA collecting phone records;" "Verizon forced to hand over telephone data"). This includes the geospatial movements of human bodies, and even the emotional states of individuals.

In addition to connections to land and reality discussed earlier, these new examples of hacking add more complexity to problems that need to be addressed by indigenous sovereignty and self-determination. At the most pragmatic level, we must ask: Do indigenous peoples have the capacities to protect digitally archived sacred knowledge against foreign government and non-government transgressions? According to recent 2014 reports, nearly half of all American adults have had their private information hacked and stolen (Pagliery). According to CNN Money, this information may include credit and debit card information, along with all the associated information linked to these credit and debit accounts. In today's world of surveillance and hacking, how do indigenous peoples operationalize their sovereignty when it can be assaulted and undermined by entities with the ability to hack their information systems? Perhaps one of the most logical answers is to take up a position in cyberspace.

Defending indigenous sovereignty within the context of pervasive electronic media requires building indigenous digital literacies capacities in relation to cultural and rhetorical sovereignty, which includes an awareness and learning of indigenous knowledge systems. It is logical for indigenous peoples to determine what they want from digital technologies such as the Internet, since these systems are here to stay (Lyons, “Rhetorical Sovereignty;” Coffey and Tsosie). In addition to deciding what we want to do with these emerging technologies, it will be necessary for us to learn how to ground our innovations and practices of emerging technologies according to our indigenous knowledge systems so that our electronic media innovations reflect our diverse local indigenous values.

Like today’s digital technologies themselves, hacking isn’t likely going to go away regardless of its moral ambiguity. As with digital media itself, the operationalization of indigenous technological sovereignty is likely to require indigenous peoples to consider what they want to do with the digital literacies capacities they construct, and how they wish to assert themselves as hackers.

In *Hacking: The Art of Exploitation*, hacker and author Jon Erickson provides us with a useful framework that we can appropriate for thinking about indigenous technological sovereignty:

“ . . . The hacker spirit can never be stopped, nor can it be easily categorized or dissected. Hackers will constantly be pushing the limits of knowledge and acceptable behavior, forcing us to explore further and further.

Part of this drive results in an ultimately beneficial co-evolution of security through competition between attacking hackers and defending hackers. Just as the speedy gazelle adapted from being chased by the cheetah, and the cheetah became even faster from chasing the gazelle, the competition between

hackers provides computer users with better and stronger security, as well as more complex and sophisticated attack techniques” (4).

According to Erickson, all forms of hacking are beneficial for the evolution of the Internet (1-5). Erickson reminds us that there is nothing inherently good or evil about knowledge, but that the application of knowledge is indeed determined by morals and ethics (4). He also argues that hacking is not only employed to break the law, but that at its core it is more about following the law (1). In fact, hackers at MIT were responsible for introducing some of the earliest computer science advances in computer programming (2-3). These hackers dedicated their time, energies, and talents to advancing computer technology through their quests to write the most elegant, reliable, useful, and efficient computer code.

In the spirit of innovation, Erickson provides us with a definition of hacking, which also connects to indigenous knowledge systems frameworks for innovation. The following quote by Erickson solidifies a framework for hacking useful for indigenous self-determination and sovereignty. “The essence of hacking is finding unintended or overlooked uses for the laws and properties of a given situation and then applies them in new and inventive ways to solve a problem— whatever it may be” (1). Until this point, I have primarily focused on hacking in the context of cyberspace. However, hacking occurs in both physical and virtual spaces, and the underlying effects and principles cross over within both contexts.

An example of an applied outcome of Erickson’s framework is what hacker and writer Winn Schwartau describes as the greatest hacking of all time (8). For this example, Schwartau points us to NASA and the crippled Apollo 13 mission to the moon.

Following an explosion onboard their spacecraft, both ground crews and the astronauts had to improvise a new life saving mission because the originally anticipated objective of the lunar mission had been radically altered. Part of what was required of engineers at NASA was to salvage, hack, and modify whatever resources necessary in order for the astronauts to return safely to Earth.

Schwartau refers to one of these hardware improvisations as “the most successful hack in history” (8). In this particular scenario, the explosion had already occurred and a great many problems needed to be addressed. At one point in the mission, the astronauts’ air supply was being dangerously contaminated by the carbon dioxide exhaled by the astronauts themselves. To address this issue, engineers back at Earth salvaged all of the same materials that were available to the astronauts in the spacecraft. They cobbled together what Schwartau describes as “an assortment of odd-looking parts” (8). Some of the materials in this assortment included plastic bags intended for moon rock collection, duct tape, hoses taken from spacesuits, and cardboard ripped from the mission log book. Using these and other parts they salvaged, the engineers designed a carbon dioxide filter, and then sent astronauts instructions for how to build one. This outcome of hacking was life saving; it played a major role in the safe return of the Apollo 13 astronauts. The interesting thing about Apollo 13 is that throughout the mission after the explosion, survival was all about salvaging, hacking, and modifying systems.

The kind of resourcefulness and ingenuity employed by NASA to help return the Apollo 13 astronauts home safely is exactly the kind of adaptive resilience that indigenous peoples around the world have been practicing since time immemorial. Most

recently, over the past 500 years, indigenous systems of hacking have not been applied to a space mission gone awry, but instead are practiced around the globe in response to the globalizing forces of colonization. The spacecraft explosion on Apollo 13, which caused what astronaut Fred Haise described as a “wicked shimmy” to illustrate the disastrous aftermath of the explosion and the cadre of problems that resulted, is a metaphor for the outcomes of colonization when viewed through an indigenous lens. What is important to recognize is that this historical “wicked shimmy” on the Apollo spacecraft is a mere microcosm in comparison to the magnitude of change forced by colonization. While the astronauts and ground control eventually resolved the crisis situation, indigenous peoples continue to resolve problems associated with ongoing scenarios of colonization that continue to negatively impact and cost indigenous lives.

Unlike NASA, an organization of explorers extending the colonial legacy of Christopher Columbus and Lewis and Clark, indigenous practices of hacking are tied to pragmatism, survival, and technological innovation that are largely defined by exercises of indigenous self-determination, which occurs within the contexts of resistance to colonial assimilation and to persist despite colonial efforts of erasure. In the U.S., for example, operationalizing native sovereignty through self-determination is a process of salvaging, hacking, and modifying. These innovation processes include: salvaging land, natural resources, manufactured materials, languages, etc. from the assaultive manifestations of colonization; hacking some of what is salvaged, such as foreign manufactured materials, and using new tools created from hacking in order to hack colonizing political, educational, economic, religious frameworks, legal frameworks,

foreign aesthetic systems, etc.; and modifying colonizing frameworks in order to subvert colonial designs, so as to create from them culturally responsive innovations that can be applied to sustain indigenous life (Gunkel 813-814; Flower 178).

In today's world of emerging pervasive communications technologies, indigenous peoples will likely have to port their traditions of hacking over to computers and all forms of digital media and digitally connected physical media, since, as I have stated before, it is unlikely that digital media will go away. Indigenous threads of hacking provide a culturally-responsive framework for digital literacies capacity building within indigenous communities because hacking is already an established tradition. Indigenous hacking is a practice that also embodies theories that presuppose the self-determination required for the operationalization of indigenous technological sovereignty.

Before I unpack indigenous hacking, its future potential, and the ethics that guide its practices, I will explain how virtual spaces and physical spaces are currently connected, as well as discuss some of the economic forces and intergenerational dromological⁹¹ (speed driven) changes associated with emerging pervasive media technologies. Establishing these contexts will help illustrate the continuum between the virtual and physical world, the economically driven value systems that support this continuum, and the impacts of velocity on indigenous oral traditional methods of knowledge transfer. These contexts are relevant because: the sustainability of indigenous traditions and cultural emergence is at stake during a time of rapid global change; during

⁹¹ According to Virilio, dromology is the study of outcomes that result from the technological ability to accelerate bodies, things, and communications. For example the dromological outcomes of the U.S. Postal Service contrast with those of email. This is because the U.S. Mail is magnitudes slower than email.

this time indigenous traditions of hacking often occur via foreign pervasive material culture; and the outcomes of indigenous hacking are often situated in relationships to places, land, and economies (H. Smith). In addition to these relevancies, the following contexts themselves also provide reasons for why hacking is a culturally sensible practice for operationalizing indigenous technological sovereignty.

As I have established thus far, hackers of all backgrounds are engaging all sectors of our world by deploying their computer literacies skills to tactically assert power and control within virtual and physical environments. Today, human life increasingly inhabits a mixed-reality environment where both virtual reality and physical reality are connected. The convergence between virtual and physical spaces is made possible by new breakthroughs allowing virtual environments to extend into physical spaces and vice versa. The mergence of physical and virtual media, also known as mixed-reality, is fertile ground for the parallel hacking of both physical and digital media.

The interfaces between virtual and physical spaces, as well as to human persons, are made possible via computer sciences that span physical computing and human computer interactions (Dourish 99-126; O'Sullivan and Igoe; Krueger 379-389). These computer science fields apply research and development towards advances of intelligent computational media systems that can sense the physical environment surrounding them. The purpose of experiential media systems is to enable human computer interfaces and provide portals connecting virtual space to physical space. This can be anything from an onboard flight navigation system or a video game console to a military drone or an artificially intelligent robot.

Physical computing makes it possible to live in the world we currently inhabit, a world whose transportation systems, power grids, water supplies, economic systems, governments, weapons systems, medical systems, etc. are all largely dependent on automated networked computational systems (Schwartau 390-407). These digitally mediated systems are operating at such extreme velocities that artificially intelligent computer algorithms automate decisions (Virilio, *Speed and Politics* 157-164). This is because today's computational velocities exceed our human capacities to make decisions fast enough to respond to high-speed dynamic digital traffic.

Because of the inextricable complexities and connections between computers and our physical world, regardless of whether hacking occurs at the site of a physical object or virtual artifact, it will in either case result in both physical and virtual consequences. This critical awareness of relationships provides a fundamental theorem that actions in cyberspace have consequences in the physical world, and that operating on the physical world affects the nature of cyberspace. This theorem is useful when considering how indigenous innovations in cyberspace might be brought into relationships with lands, and vice versa.

The high-speed nature of today's networked computational technologies signals a projected future of varying intergenerational dromological perceptions (McChesney 13). These variations are already striking in the present, and will continue to widen as a function of acceleration. This means that, for example, the culture that my parents grew up in is radically different from the one I grew up in, which is largely the result of the advancing communication and computational speeds of emerging technologies. The idea

that parents don't live within the same culture as their children is an outcome of speed both driven by rapid technological changes as well as the rapid changes catalyzed by these emerging technologies themselves. These rapid changes are highly consequential for all humans considering that, not too long ago, before the industrial revolution, the world experienced by a grandmother when she was a child was not all that different than what was experienced by her grandchild.

Dromological intergenerational changes disrupt the flow of knowledge transfer from elders to youth that have sustained indigenous communities for millennia. This is because in many cases today's indigenous youth now possess more technological know-how than their elders. However, although youth may possess knowledge, unlike their elders, they lack experience. Building indigenous intergenerational digital literacies capacities will require knowledge communities to develop new indigenous protocols for bi-directional intergenerational knowledge transfer.

In addition to the social and cultural impacts of intergenerational dromological changes, emerging pervasive media technologies also have other political and economic implications for indigenous self-determination and sovereignty. Today's networked systems are designed to: inspire consumerism under the guise of social connectedness; inspire consumerism through individual desire by appealing to individualism through product customization; create economic valor through utopian ideologies of progress; and produce surplus value through consumer co-production strategies requiring free on-demand citizen labor (Gee, Hull, and Lankshear 26-31, 36; Kozinets 869-870; Marazzi 44, 50-64, 114-115). Corporations now blur the lines between labor and consumption by

tracking where consumers are located 24 hours a day; positioning consumers as free citizen laborers; requiring longer more intense work days from workers; and pooling consumer resources for beta testing products and a variety of other crowdsourcing tasks (Marazzi 44, 50-64, 114-115).

According to new capitalism and fast capitalism narratives, global market systems usurp private life and destabilize the general autonomy and sustainability of many indigenous communities who have not yet fully connected to global markets (Marazzi 117-119; Strange 147). Fueled like Manifest Destiny, new and fast capitalism is expanding throughout the world as global market systems seek out new potential resources, markets, and labor forces (Sennett16). As markets emerge and pop like bubbles, or as they come go, they leave a trail of inequity, often causing workers to leave their homelands in search of employment.

In regions where there is market saturation, fast capitalism is sustained by models of financial capitalism perpetuated by unsustainable consumer product designs embedded with planned obsolescence (Marazzi 60; Sennett 140). The hidden logic within planned obsolescence lies with the insatiable market generated consumer demand for improved (slightly modified) products customized to meet individual needs and desires (Gee, Hull, and Lankshear 26; Marazzi 50-64; Sennett 142-157). This culturally homogenizing process perpetuates itself through market branding, as it constantly generates new exploitable consumer desires while consumers look toward new desires after old desires have become fulfilled (Gee, Hull, and Lankshear 26-27; Sennett 142-157).

In order for corporations to generate profits in a climate of fast capitalism, they are racing against each other to be the first to distribute the most affordable and responsive product to consumers (Gee, Hull, and Lankshear 26). In other words, today's market competition is not only about providing consumers with the lowest price, but also about being the first to respond and successfully anticipate consumer demand at a low price. A large part of the needs and desires of consumer demand are driven by consumers who are now using goods and services as a way to customize their identities (28). Through violence made complete by financial capitalism, the wealthiest 1percent of the global population become exponentially wealthier as these market systems create economic disparities and inequities in the world through the exploitation of cheap labor, free citizen labor, privacy, and environmental resources (Gee, Hull, and Lankshear 44-48; Marazzi 117-119; Sennett 16-17, 54; Strange 154).

This violence capitalism occurs in all sectors of the market, and is particularly legible in the technology market every year that tech companies release, with great fanfare, the sleeker, faster, higher resolution, more improved computer tablet or smart phone. Despite market saturation, a massive amount of customers are happy to discard their perfectly working devices in order to have the "latest and greatest," which they themselves demand. This fast capitalism is compounded by advances in technology that rapidly empower new product improvements, which is what corporations capitalize on in their attempts to survive fast consumer demands based on what amounts to the consumer's desire for symbols of status and identity (Gee, Hull, and Lankshear 26-29).

Technological advances are a feedback loop, which are a function of and drive fast capitalism. This feedback loop highlights one example of how emerging pervasive media technologies are encoded with the values of unsustainable globalizing capitalism. To make matters more concerning, markets are constrained and regulated by a multinational oligarchy deeply concerned with the construction and maintenance of their power via corporate shareholders, and certainly not the sovereignty of indigenous groups, especially when there exists the opportunity to create monopolies by establishing scarcities in the world (Marazzi 60). Indigenous sovereignty does, however, attract corporations when there exists interest convergence worth their investment. Barring interest convergence in the presence of indigenous self-determination, these aforementioned narratives of global advancement arguably reflect the latest version of colonization (Sennett 18).

Emerging pervasive media technologies are encoded with values that perpetuate fast capitalism and reflect the historical cultural lineages of today's globalizing technological advances. Both fast capitalism and market driven emerging technologies do not reflect indigenous Discourses, because they do not originate from indigenous communities. Yet as they proliferate indigenous communities, they require the complicity of indigenous populations to reorient themselves to foreign worldviews. Within indigenous communities, governments and corporations through these technologies have the potential to leverage their seductive consumer paradigms in order to usurp indigenous life through assimilation by entrenching communities in debt, subjects of market

branding, and identity building consumer behaviors (Gee, Hull, and Lankshear 26-27; Marazzi 50-64, 117-119; Sennett 142-157).

A feature of indigenous life, as it is to some degree reified through cultural traditions and philosophies, is such that identities are co-constructed via relationships with people, land, and one's contributions to community life. In contrast to the culture of fast capitalism, representations are not driven by the individual's needs and desires to construct his or her identity in relation to manufactured goods, and many traditional indigenous economic protocols disallow unregulated capitalism to provide an economic climate conducive to the emergence of oligarchic power (Miller 17-18, 162).

Despite the contrasts between technology driven fast capitalism and philosophies of indigenous life, emerging media technologies remain pervasive and are seductive. One of the powerful seductions of today's technologies is their user-friendliness. Simple intuitive user interfaces and determined/anticipated consumer functionality prevent the need for the average users of these technologies ever to venture outside the computational products and paradigms that they are subjected to by the market (Sennett 143, 171). These user-friendly options distract users with a value-laden scripted usability, often preventing people from experiencing the need and desire to acquire lower level digital literacy skills in order to understand how the technology actually works, and to manipulate technology with greater power (170-173). Those who are not seduced, or who are driven by ulterior motives, are the hackers. Hackers understand that power is not transparent via their technologies unless they open doors to see what's inside.

The lack of free market systems due to the emergent power of a multinational oligarchy, and the exclusion of indigenous innovation and capitalism from the potential construction of a free market system, attempt to occlude indigenous voices from participating in global dialogues and building local knowledge and financial capacities (Marazzi 60). These capacities, according to Native American economist Robert J. Miller, are vital to indigenous self-determination and sovereignty. Miller argues that building local knowledge and financial capacities are part of traditional indigenous capitalism, and, within the context of the United States, must be repatriated for economic development in Indian Country (1-6, 11, 115-118, 160-164). The fact that economic systems must be repatriated is not a deficit of American Indians, but a result of colonization. Miller argues that this can be overcome through what he refers to as reservation capitalism, which is a form of capitalism based on indigenous traditions, new indigenous innovations, and native self-determination and sovereignty.

In addition and related to the market based exigencies within fast capitalism, it is the reality that only a minority of people in the world who can read and write computer code play a significant role in designing emerging media technologies. Arguably this handful of people is creating the powerful frameworks that increasingly determine everyone else's cultures and everyday lived experiences. According to cyber-law scholar, Lawrence Lessig, these frameworks are laws that are not legislated by governments, but are instead created by computer programmers whose computer coded architectures and values form the legal frameworks that increasingly order people's behaviors (*Code and Other Laws* 196, 198, 199, 207). Lessig's theory suggests that the sovereignty of

cyberspace is operationalized by the computer code written by computer programmers, and that this sovereignty is so powerful, that it is whittling away at the sovereignty of governments and peoples who, until recently, have only had to operationalize sovereignty in physical space (196, 198).

The idea that a small minority of people is having this kind of impact on the world becomes especially problematic for humanity considering Google's latest diversity report ("*Making Google a workplace for everyone*"). This report reflects similar reports by other tech giants such as Apple, Intel, Microsoft, and Facebook. These statistics demonstrate the disparities that exist within these companies both across ethnicity and gender. What they show us is that a large degree of the technology we use today, exported by the United States, is vastly limited to the values, perspectives, and imaginations of mostly white men. This is a power differential that also echoes that of the multi-national corporate oligarchy and shareholders who possess control over most of the global economy (Cohen; McChesney 19-20).

Diversity reports by the tech industry have been kept secret for quite some time, but were recently revealed after intense public pressure. To mitigate the fallout of their disclosures, they have all released statements that pledge their commitments to diversify their workforces in tech related fields. From the standpoint of economic equity, this is good news if these companies follow through. However, just because companies diversify their workforces doesn't mean they are interested in diversifying the value-laden discourses and politics of their technocracies. In fact, it is likely that they will exploit cultural identities and aesthetics, but not embrace the epistemologies and

ontologies of diverse peoples (Gee, Hull, and Lanksheer 29). In my estimation, diversifying emerging media technologies is likely the work that we the people will have to do if we are to have cultural sovereignty, rhetorical sovereignty, or any other forms of sovereignty that are diverse and which we self-determine for ourselves.

As mentioned earlier, all of these contexts help define the reason why hacking becomes a tactically strategic method for operationalizing indigenous technological sovereignty. Because of the hegemonic nature of global market driven emerging pervasive media technologies, it is imperative that indigenous peoples develop indigenous digital literacies capacities in order maintain their cultural traditions of hacking. These traditions help construct local and distributed economies of scale based on indigenous values, and if they are ported into cyberspace and digital media they will have the capacity to provide valuable critiques of laws and politics that are operationalized by computer code.

Technological sovereignty is operationalized when indigenous populations hack today's globalizing technologies to ensure their participation in the design process, despite, in many cases throughout the world, their erasure from the processes of industrial design and institutionalized computer science and globally influential ideation processes. Indigenous peoples that extend their traditions of hacking with digital literacies capacities will have the ability to contribute their own value laden and politically self-determined code for their own forms of indigenous sovereignty. Furthermore, diverse indigenous codes can diplomatically contribute towards a more culturally responsive Internet whose multi-national sovereignty is designed from the ground up, and not by just a handful of

corporate and non-profit organizations who are making decisions on behalf of humanity. These indigenous contributions may also provide indigenous peoples with insights into how international spaces such as cyberspace can be positioned to support their geospatial sovereignty predicated on land.

Hacking foreign pervasive media within frameworks of indigenous technological self-determination and sovereignty is the recoding of indigenous values into the DNA of emerging pervasive technologies. This happens by grounding designs and uses of emerging technologies in accordance with indigenous knowledge systems so that these systems themselves breathe and circulate within indigenous communities, and within the relationships between people and the lands they inhabit. These acts of self-determination are what operationalize indigenous technological sovereignty within the various technological, cultural, political, and economic contexts described above.

To extend the theory, which I have repeatedly argued in this essay, that the worldviews of designers are encoded in design, participatory design scholar Cristiano Storni argues that design is impregnated with varying intentions of power (161-169). This power is a function of the intentions of various designers, and is contextualized by the systems designers are in service of, as well as the often-unsuspecting desires of end-users. Storni offers a critique at the most basic level of design by studying the lexical etymology of words within the field of design. His approach to uncovering differentials of power between the design and user is helpful in understanding the implications of emerging pervasive technologies that proliferate indigenous communities. Storni's discourse analysis deserves the following full quotation:

In discussing the word 'design', Flusser (1999) lists a series of meanings of the word (as a noun and as a verb) such as: 'plan', 'intent', 'aim', 'scheme', 'plot', and 'to draft', 'to sketch', 'to fashion'. These meanings are shared in other languages as in the Italian 'disegno' and French 'dessin' (a drawing, but also a plan). Interestingly, Flusser stressed that these meanings are connected with 'deceit', 'deception', and 'cunning'. In discussing highly significant words connected with the notion of design, Flusser reaffirmed this interpretation and showed how the word 'machine' and 'mechanics' share the same connotation. The Greek 'mechos' denotes a device designed to deceive - i.e., a trap – of which the Trojan horse is an example. Ulysses is called 'polymechanios', which school children translate as 'the crafty one'. Similar considerations are dedicated to the word 'technology'. The Latin equivalent of the Greek techne was in fact art, which suggests a metaphor similar to the English rogue's 'sleight of hand'. Hence 'ars' means something like 'agility' or 'ability' (the ability to turn something to one's advantage) and artifex - i.e., 'artist' - means a trickster above all. That the original artist was a conjurer can be seen from words such as 'artifice', 'artificial' and even 'artillery'.

These series of considerations help us to look at design as the art of deceiving, and at the designer as the conjurer, someone who carefully and skillfully plans a plot or a machine to deceive. To deceive what exactly? Well, ideally to deceive the obstacles that complicate our life. As an illustration, Flusser used the example of a lever as something to cheat gravity, and 'mechanics' is the trick of fooling heavy bodies. The Czech philosopher further notes that word design derives from the Latin 'signum' which corresponds to the English 'sign' which refers to 'something that conveys information or instruction' (a mark, a trace, an indication, or a signature). As noted by Terzidis (2007), the prefix de is used not in the derogatory sense of opposition or reversal, but in the constructive sense of derivation, deduction or inference (pg. 69). In this sense, design is about conveying information so that obstacles can be cheated. The idea of design as conjuring however suggests how the design trickery might include not only the obstacles of our world, but also those who attend to the 'magic of the conjurer'. Indeed, a conjurer is someone who makes something appear from nowhere as if it is magic. In this sense, a conjurer, by definition, cannot reveal what lies behind his/her tricks: to keep them secret and not accessible become key (interestingly enough 'congiura' in Italian means 'conspiracy', 'set up', and 'plot', all terms that reaffirm deception and secrecy). To build a machine is always to build a machination, says Latour (1988) (163).

Storni's analysis not only illustrates the values of Western-centric design, but also provides a critique illustrating that designers have a great potential power to interpret reality on behalf of others, as well as to assert values upon others. Storni refers to design as "de-sign," or removing the "sign," in the cases where designers assume power over

others by making it difficult for users to critically engage designed artifacts (161, 163-164). Perhaps from an indigenous perspective, Storni's critique would extend out to mean to "de-sign others," or the "de-sign" of cultures and identities (162-163). This critique demonstrates the potentially dangerous implications associated to the tech industry's latest diversity or — lack of diversity — reports. The lack of diversity only leads to "de-signs" resulting from the limited knowledge of mostly white male de-signers.

What is equally striking about Storni's analysis is that, not only do designers assert power through conjuring illusions to those willing to believe in their magic, but also designers further extend their power by making the secrets of their illusions inaccessible (161, 164). In this case, the Apple Corporation comes to mind, a corporation that does a good job of hiding the seams of their designs, thus disguising any evidence of ideation. Given Storni's theory that design conjures illusions, how are peoples supposed to begin to recognize the existence of these illusions when even society in general lacks the critical media literacy skills to identify that there is trickery at play? Unaware that the perceived reality is conjured, how are we supposed to make self-determined choices for our lives when we are unaware of what aspects of reality are genuine and what are conjured? These questions remind us of Baudrillard's theory that people are largely unaware that human designed and constructed topographies have supplanted reality itself, largely because most of us lack a critical awareness of the hyperreality in which we live.

The idea of design as conjuring ties back to my earlier argument about the seductive power of user friendliness. Within Storni's analysis and critique, user-friendliness itself can be re-interpreted as an illusion conjured by designers (164).

Through Storni's analysis, end-users experience the design conjured illusion of "user-friendliness" as they are distracted from the secrets that make illusions possible (164). If it were not for hackers, there would be no knowledge of systems to expose, challenge, and balance the potential powers of designers and their underlying secrets, especially when the sophistication of designers' illusions are high budget productions supported by multibillion dollar international corporations.

According to indigenous scholar Bryan Brayboy's "Tribal Critical Race Theory in Education," one of the tenants of colonization is that governmental policies and educational policies towards indigenous peoples are intimately linked around the "problematic goal of assimilation" (429, 436-437). By linking this tenant to global market systems, I will attempt to extend Brayboy's theory by arguing that there is a lack of participation across diversity and consideration of diverse worldviews within all sectors of commercial design. In the marketplace, commercial designs render and mediate economic systems. At the same time these systems are rendering commercial designs toward pervasive ubiquity. This economic feedback loop is complicit in the erasure of indigenous peoples. Erasure occurs via assimilation as powerfully pervasive designs, backed by billion dollar corporations, disseminate the work primarily of white men with the limited capacity to conjure a homogenous cultural-centric repertoire of illusions. These illusions are designed by corporations to be extremely seductive, and with particular objectives, via assimilation, to seduce peoples of all backgrounds in order to create new market valor.

Storni argues that designers often intend to “empower” end-users with their designs and that such a pursuit, although it may seem engaging, is contradictory because designers must choose what powers to allocate end-users with (162-163). These decisions by designers are based upon their own implicit assumptions about the types of powers that need to be passed on. Again, Storni argues that design for empowerment results in contradictions. To support his claim he refers to communications scholar Philip E. Agre, who argues that the very idea of empowering someone is also an act of operating on someone, which is antithetical to self-determination (162). Storni argues that designers are implicated in acts of colonization when their intentions are to empower end-users. He goes on to argue that instead of a designer influencing an end-user to act a certain way, users should be able to, through “empowerment-in-use,” define, what Agre refers to as, their own “. . . identities and desires and intentions. (qtd. in Storni 163)”

In a different interpretation of empowerment through design, according to Agre and Storni, if empowerment means ameliorating the susceptibility of an end-user to be programmed by design, then empowerment in-use or design-after-design takes on new possibilities that might lie outside of colonization (163). Storni grapples with the idea of empowerment because his goal is to argue toward what he refers to as “empowerment-in-use,” which allows for a two-way dialogue to take place between designer and user. Storni’s argument for a type of design that ameliorates “conjuring” is one where the designer needs not mitigate his or her assumptions about or motives of power, but instead ensures that the components and seams in the design are made visible and accessible so that they can easily be appropriated and modified if for whatever reason a user feels

compelled to do so (165-169). By rendering a design's seams as visible, the designer makes a design's ideation more transparent to the user. A conspicuous example of this type of design is made readily available by open source design frameworks such as Arduino⁹², where both the hardware and software are visible and accessible. Without enclosures to hide power from users, these maker space and DIY frameworks offer users exposed interfaces for engagement, by which design-after-design and critical engagement of technology is encouraged.

Maker space platforms, such as those provided by Arduino, provide excellent frameworks by which to hack and learn digital literacies skills; they, to some degree, broaden participation; mitigate design-as-conjuring; and support Storni's arguments toward empowerment-in-use. The idea of empowerment-in-use is a valuable possibility for operationalizing aspects of Tecno-Sovereignty. However, using open source frameworks has its limitations. Although they mitigate "conjuring," many of these frameworks also remain part of an industry ecology of patented proprietary designs, a marketing scheme by which designers and manufacturers benefit from models of new capitalism, that include crowdsourcing, free citizen labor, and consumer beta-testing (Marazzi 50-64). Furthermore, their components are assembled in factories that exploit labor at low wages, often within indigenous communities (Bardzell). By establishing violent financial capitalism within indigenous communities, corporations create systems of debt that entrench indigenous peoples in serfdom (Marazzi 60, 117-119).

⁹² An Arduino is a microcontroller device that can be connected to sensors and actuators. This device is designed so that consumers can create and program their own electronics. The computer language and hardware platform is an open source framework, meaning that the device is designed so that I can be legally hacked, and used to create whatever the designer/user wishes.

Indigenous hackers do not seek to be complicit as promoters of exploited labor, nor do they appear interested in purchasing DIY products for the privilege to hack. In other words, indigenous hacking does not occur via community investments into products that are going to “empower” them as hackers. In the case of DIY and maker spaces, these paradigms are clever methods of branding for the promotion of products that appeal to the fast capitalist identity formation desires of individual consumers. Within these marketplaces, open source systems such as Arduino and maker spaces become emerging pervasive media in the same way that the conjurer’s emerging smartphones and tablets pervade, proliferate, and usurp public life (Bardzell).

Beyond factory produced patented proprietary open source frameworks of “empowerment,” indigenous hacking is fully self-determined in that hackers out of their own needs and desires appropriate new and discarded materials and manufactured goods locally available, all of which are viewed as salvage, for the purpose of design-after-design. In traditional forms of hacking within the contexts of indigenous self-determination and sovereignty, it is not the intentions of hackers to collaborate with designers of large scale manufactured pervasive media, but instead to salvage this media to subvert and re-imagine it as an expression of resistance and autonomy. In the case of indigenous hackers, design-after-design or re-design by end-users does not only lie outside of colonization, but transgresses assimilation while also meeting the self-determined needs of the hackers and their communities.

Unlike the participatory design expectations of end-users as collaborators that are sought out by Storni and many designers from the participatory design community⁹³, the intentions of indigenous hackers are not to commiserate or collaborate with designers. On their own terms indigenous hackers subvert the originally intended uses of foreign designed artifacts, making themselves full participants in global dialogues with designers about political, economic, cultural, and rhetorical power. As indigenous peoples assert this power, they also resist co-optation by maker movements. Perhaps within the participatory design community, this is an unexpected form of participation, or at least at this point the PD community does not seem to have identified, acknowledged, or analyzed these engagements as a form of public rhetoric and participation. In the final part of this chapter, I will call attention to evidence of indigenous hacking as a practice of ‘design-after-design’ in response to colonization.

An earlier historical example of a foreign pervasive technology that had profound implications for indigenous peoples in North America was the construction and expansion of the railroad system. Very much like the Internet today, the railroad was a technology that ushered in radically increased velocities that redefined time-space. During the latter part of 19th century, this transportation system was arguably one of the most important tools for the westward expansion of settler-colonial societies. The consequences of this expansion included the decimation of indigenous food sources like the herds of buffalo, and it required Native American tribes to cede land, as well as to

⁹³ The participatory design community is rooted in Scandinavian activist design traditions that date back to the 1960s and 1970s. During its inception, designers questioned the power designers had over users, and sought to complicate this relationship by imagining ways by which users would have agency to co-design tools with designers.

live on reservations (Ruuska 574-578, 581-586). Additionally, the railroad empowered government sponsored surveillance programs meant to protect its “wards.” It also empowered violently forced assimilation such as the establishment of boarding schools and other forms of subjugation that sought to erase all aspects of indigenous life.

Initial indigenous responses toward the construction of the railroads included mostly methods of sabotage (586-587). This can be considered a type of physical hacking of these systems, similar to the “denial of service” attacks that occur over the Internet. During the early stages of railroad construction in the 19th century, Native Americans innovated various methods of sabotage as acts of resistance toward the violent expansion of railroad systems into their aboriginal territories, requiring them to become experts of railroad technology. Over time, indigenous tactics of resistance would begin to shift from critically engaged methods of sabotage to critically engaged methods of appropriation and hacking including the indigenous stewardship of the railroad system (587-589).

Beginning during the 1860s and progressing onward, Native American populations first hacked the railroad to support resistance that started with sabotaging systems. Later, indigenous peoples radically changed their strategy to becoming stewards of the railroads as segregated passengers. Eventually, they positioned themselves as stewards of the railroads as non-segregated passengers. Throughout all phases of hacking, indigenous peoples used the railroad as an act of self-determination in order to both resist and survive Westward Expansion (594-597).

After two decades of sabotaging the railroad system, in the 1880s indigenous peoples decided to appropriate and hack the railroad system in a new way. Although the

railroad was the ultimate tool for 19th century colonization in America, it also became a definitive tool of survival, resistance, and cultural emergence for Native Americans (575-580). The railroad, an indigenous appropriated and hacked tool eventually became so effective that Native Americans themselves began to steward the health of these systems. Native Americans stewarded the railroad systems by informing railroad companies when the forces of nature had compromised sections of the track. Using their entrepreneurial spirit, Native Americans brokered deals with railroad companies that allowed them to ride the system for free in return for stewardship (587-589).

By hacking and re-imagining the railroad, indigenous peoples found a way to recode the railroad with an indigenous worldview in order to subvert systems of oppression. Indigenous acts of recoding the railroad operationalized technological sovereignty. To achieve this sovereignty, indigenous peoples also built complimentary capacities that made it possible to operationalize other forms of sovereignty, such as cultural and native sovereignty. What Native Americans had done was hacked and modified the railroad system into a social networking tool, via hi-speed travel, that made it possible to construct and expand Native American intercultural and multinational indigenous networks built upon a shared Ghost Dance (578-580, 589, 591-597). This spiritual and political movement would eventually contribute to the very foundation of today's American Indian Sovereignty.

By hacking and repositioning the railroad as medicine, Native Americans made it possible to pool their political and spiritual resources together in order to overcome surveillance and imprisonment on reservation lands. This self-determined design-after-

design also made it possible to start a cultural renaissance during a time of extremely violent change. Moreover, it provided indigenous peoples with the means by which to restore their dignity as passengers who were eventually no longer segregated from riding within the passenger cars. This was the indigenous self-determined repatriation of dignity that had been stolen by colonizers (Alfred, *Wasáse* 175).

Another example of indigenous hacking, this time by borderlands mestizos in the Southwestern United States, took place a century later. Similar to the Native American railroad hackers of the 19th century, Chicana/o hackers of the 20th century also targeted a new form of transportation as a site for hacking. This site was the newly mass produced automobile. In both cases, the advent of the railroad and automobile represented an increasingly ubiquitous/pervasive media technology. Using what would eventually emerge as Mexican American and Southwestern Native American traditions of hacking, also referred to as *rasquache*⁹⁴ (borderlands folkloric systems of hacking), mestizos would hack a foreign technology that, like other previous foreign technologies, ushered in new cultural paradigms of increasing velocities (Ybarra-Fraustro; Virilio, *Speed and Politics*). In the case of Chicanas/os, the purpose for hacking this newly emergent transportation system was to specifically target the faster velocities that had proliferated and usurped indigenous time-space.

⁹⁴ Rasquache is the appropriation and adaptive reuse of foreign artifacts and discarded materials for the creation of new tools and objects through an extemporaneous design process (a process of hacking and modifying foreign artifacts to create new forms and uses). Rasquache becomes as a tactical approach to media as it resists the assumptions embedded in the designs of factory manufactured artifacts. Rasquache practices are employed to strategically undermine the originally intended functional uses and aesthetic properties of foreign designs. Rasquache traditions are also pragmatic as well, and therefore are an expression of resourcefulness (Ybarra-Fraustro).

As life in the Southwestern United States got faster as a result of the automobile, Chicanas/os decided to launch a series of “denial of service” attacks throughout parts of the American highway system. The intentions of these hackers, known as Lowriders with a capital-L, were not to stop the flow of traffic altogether, but to repatriate a sense of traditional indigenous time-space by slowing traffic down. To achieve this goal, they appropriated, salvaged, hacked, and modified automobiles in order to transform them into lowriders, whose designs empowered speed often described by Chicanas/os as “low and slow.” This was made possible through modifications of automobiles that included lowering an automobile’s chassis so low to the ground that there was no other way for these cars to perform, but at a snail’s pace (Calvo 3). This lowrider tradition of salvage, hacking, and modification continues today.

Like Native American railroad hacking a century earlier, lowriders were designed to mediate politics and spirituality via social networking (Chappell, “Lowrider Cruising Spaces” 1-12). As history repeats itself, the outcomes of lowriding produced uncannily parallel implications to those of Native American railroad hacking. Chicanas/os throughout the Southwest evolved the purpose of lowriding to include social re-imagined ceremonial gatherings referred to as lowrider car shows. The actions of Chicana/o Lowriders proved to have broad, powerful, and complex implications for indigenous self-determination, rhetorical sovereignty, cultural sovereignty, and aesthetics/spirituality.

In both these cases, Native American railroad hackers and Lowriders used innovation frameworks predicated on hacking by appropriating, salvaging, and re-adapting foreign cultural artifacts and materials to create functional, symbolic, and

aesthetic designs reflecting local indigenous values. Although I have provided one Native American example and one indigenous mestizo example, these do not represent isolated occurrences of hacking, but instead are part of over 500 years of indigenous traditions that respond to colonization. Prior to colonization, indigenous peoples throughout the Western Hemisphere hacked new innovations into existence, and were hacking each other's innovations since time immemorial.

Halfway around the world, in the Eastern Hemisphere, similar phenomena by indigenous peoples also occurs. Let's take a look at an example by indigenous peoples in Tanzania. According to international technology transfer scholar, Jens Müller, evidence of iron smelting in Western Tanzania dates as far back as 500 B.C., and evidence suggests that iron smelting and iron work in Tanzania have been a part of the indigenous peoples of this region for as long as they remember (Müller, "An Other Path" 241; Müller, "Making Ends Meet" 38). Müller's research focuses on the complex topic of what he refers to as endogenous (originating from within a community) and exogenous (imported from elsewhere into a community) technology, and the interaction between the two types of technologies within indigenous communities in Africa and Latin America in relation to complex social, political, and cultural contexts (Müller, "An Other Path;" Müller, "Making Ends Meet").

In the case of Tanzania, today indigenous communities continue their traditional cultural practices of blacksmithing that have spanned millennia. These practices have remarkably survived despite the colonial outlawing of indigenous blacksmithing in the late 1800s; the colonial marginalization of, and obstruction of indigenous practices; and

more recent efforts by global market systems to industrialize/globalize local economies after blacksmithing was made legal at independence (Müller, “Making Ends Meet” 38-39). Despite many international and European organization’s efforts’ to stimulate economic growth by importing assembly line industry to Tanzania, Müller’s analysis indicates that local indigenous knowledge systems provided the most well adapted technologies, thus spurring an indigenous or endogenous⁹⁵ innovation trajectory in Tanzania despite colonial efforts (“An Other Path” 235-236, 243). For example, indigenous peoples have preferred to remain faithful to their indigenous production practices, such as blacksmithing, as a way of life, and local farmers prefer the work of local blacksmiths because the tools they produce are best adapted for the “. . . local soil conditions and the crops” (Müller, “An Other Path” 240-241, 243).

According to Müller, the International Labour Organization observed that these indigenous practices have proven to be economically viable (“An Other Path” 240, 243). From his analysis, Müller concludes that the contemporary practices of blacksmithing in Tanzania reflect both traditions and new innovations, both of which are self-determined by blacksmiths. Despite the innovations by Blacksmiths, the core indigenous techniques remain preserved (Müller, “An Other Path” 245-246; Müller, “Making Ends Meet” 51-52). During his investigations, Müller came across several recent endogenous innovations resulting from the salvaging, hacking, and modifying of exogenous technologies (“An

⁹⁵ Meaning locally embedded, having indigenous local origin, something that is self-determined from within, perhaps through salvage, hacking, and modification, or “growth from within. (Müller, “An Other Path 239-240)”

Other Path” 252; Müller, “Making Ends Meet” 45-57). I will highlight one of these innovations in the following two paragraphs.

Traditionally, smelting hearths were operated using goatskin bellows, which Müller observed have recently been replaced with bicycles that have been hacked and modified into bicycle wheel powered fans (“An Other Path” 245-246; “Making Ends Meet” 47, 51-52). This particular innovation cuts down on the amount of labor required to operate the hearth, improving the efficiency of local production. Although blacksmith techniques have largely remained unchanged, Müller observed that these types of local innovations are common within blacksmith workshops (“Making Ends Meet” 47-56).

This bicycle hacking example by Tanzanians demonstrates technological sovereignty in action. It is an example of hacking that meets the needs of local communities at a pragmatic level, while at the same time hacking and other local innovation techniques are employed to resist the foreign industrialization of their cultural maker traditions (Müller, “An Other Path” 241). In the case of blacksmithing, I will quote Müller’s supporting conclusion: “In sum, while most politicians and academicians are mainly trying to find ways to improve formal sector national production systems with the aim to maintain or achieve *international* competitiveness, informal sector operators are daily striving to maintain and achieve *national* or local competitiveness, making use of informal sector systems of innovation” (Müller, “An Other Path” 251).

A few more examples of indigenous hacking that I will highlight come from the indigenous Sámi of Nordic Europe. The following examples of hacking are from an exhibition curated and staged by artists Joar Nango and Silje Figenschou Thoresen. By

way of focusing on particular examples of Sámi hacking, I will start by citing texts from the artist statements by Nango and Thoresen refer to the subject of their work as “Indigenuity” (“About the indigenuity project”). The following paragraphs focus on Sámi traditions, philosophies, and practical implications of salvage, hacking, and modifying.

Nango and Thoresen describe the “Indigenuity” project as an exhibition that demonstrates Sámi design traditions. The artist-writers, Nango and Thoresen, articulate these traditions as a cultural practice of planning or improvising designs for producing diverse solutions to diverse problems (n. pag.). The designs archived in the “Indigenuity” project show a broad ranging body of designs, all of which characteristically expose the ideation process. These designs demonstrate an indigenous practice of hacking that is highly pragmatic, esoteric, place-based, resourceful, and aesthetic. The designs themselves also highlight an important feature of production: which is that they are typically constructed from salvaged or recycled materials, and by appropriating pervasive manufactured designs that have proliferated Sámi communities (n. pag.). According to the artist-writers Nango and Thoresen, Sámi design traditions are one-off solutions employed for the purposes of addressing a time-based and place-based problem, which contrasts sharply with design for mass production (n. pag.).

These Sámi design traditions similarly reflect all of the examples that I have presented thus far, and are uncannily similar to Native American adaptive reuse and Chicana/o rasquache traditions, as well as recent hacking by blacksmiths in Tanzania. Sámi design traditions are so similar, in fact, that Nango and Thoresen seem to be defining the characteristics of North American indigenous traditions and Tanzanian

indigenous practices as they describe a tradition of their own peoples, which according to Nango and Thoresen is “. . . the ability to understand our environment and to improvise, using what you’ve got, and seeing the value of this” (n. pag.). Nango and Thoresen state that these design-after-design practices are not unique to the Sámi, while stressing that these practices are highly embedded in the arctic Sámi culture. There are endless examples of indigenous hacking throughout the world. All of the examples that I present in this chapter don’t even begin to scratch the surface.

Nils Oskal, a senior researcher and publisher on indigenous rights at the Sámi University College in Guovdageaidnu, Norway, responds with his thoughts on “Indigenuity,” as embodying “. . . a particular emphasis on ideals of self-reliance, the ability to find creative and innovative solutions on the grounds of limited material resources in local communities” (n. pag.). Doesn’t Oskal’s definition sound resoundingly familiar to what hacker Schwartau refers to as the most successful hack in history — the carbon dioxide filter fashioned with tape, cardboard, moon rock bags, and whatever limited resources the astronauts on Apollo 13 had available to them? In the case of Apollo 13 and indigenous peoples, I am referring to hacking in the context of catastrophic change. Colonization has systematically subjugated indigenous peoples who have responded by hacking various aspects of colonial culture in order to exercise self-determination as a way to preserve and restore their dignity and sovereignty.

Part of the indigenous restoration process of dignity and sovereignty is resisting and surviving the systematic superimposition of poverty via colonization. Oskal shares his analysis of indigenous resilience to the catastrophic changes of colonization and

discrimination (non-inclusion) by defining the following aspect of “Indigenuity.” About Nango and Thoresen’s exhibition, Oskal is quoted as stating, “Knowledge on management of changeability involves precisely not building big and heavy arrangements and institutions for solving problems, but mobile, flexible, and temporary solutions that work for the time being, in natural conditions that are capricious and unpredictable” (n. pag.). Oskal’s statement is similar to art historian Tomás Ybarra-Fraustro’s descriptions of rasquachismo (Chicana/o hacking): who states that “In an environment in which things are always on the edge of coming apart (the car, the job, the toilet), lives are held together with spit, grit, and *movidas*” (133). According to Ybarra-Fraustro, “Movidas are whatever coping strategies one uses to gain time, to make options, and to retain hope” (133). Similar to what Nango and Thoresen highlight about indigenous hacking in Sámi communities, Ybarra-Fraustro describes rasquachismo as “A compendium of all the movidas deployed in immediate, day-to day living. Resilience and resourcefulness spring from making do with what is at hand (*hacer rendir las cosas*)” (133).

It is through the process of hacking material culture (a first order operation) that indigenous peoples produce the tools they need hack the very economic systems implicated in the colonial hijacking of their local and regionally networked indigenous economies (a second order operation). In addition to resourcefulness and adaptability, Ybarra-Fraustro also states that rasquachismo, although highly pragmatic, is “. . . yet ever mindful of aesthetics” (133). By strategically hacking tools, indigenous peoples exercise their “Indigenuity” in order to adapt to rapid changes, and apply their aesthetic sensibilities to hack markets selling products planned with embedded obsolescence in

order to create their own culturally sensible systems of wealth. Indigenous hacking is a self-determined process allowing indigenous peoples to adapt to fast changes based upon how they wish to culturally engage pervasive media. These actions of critical engagement fundamentally operationalize what I refer to as technological sovereignty.

During a 2014 indigenous artist residency titled “GPS or Hacking the Coordinates to Enable Shape Shifting and Shadow Networks” at the Banff Centre in Alberta, Canada, I learned about the work of indigenous Sámi artist Joar Nango through his presentations to artists in residence. During the residency Nango was in the process of examining the adaptive reuse practices of his community, which he referred to “Indigenuity.”

Joar shared a series of images he produced of his community’s practices from his photo archive documenting examples of “Indigenuity.” In this chapter I interpret “Indigenuity” as indigenous hacking, not only because the scholarship supporting “Indigenuity” also describes a culture and processes of hacking, but also because Joar’s archive included the following evidence of hacking: a hauling sled consisting of a constructed forklift shipping pallet assembly mounted to three salvaged downhill skis; a kitchen oven re-imagined into a hot water tank; door mats made out of salvaged snow mobile belts; a board covered with upside down bottle caps, used for fish descaling; milk cartons recycled for packing and freezing berries and for potting flowers; newspaper used as linings to insulate shoes; and a modified cement mixer wired with trip sensors in order to frighten reindeer as a way to deter them from entering certain places. These are only a few of the examples archived by Joar and his colleagues. From these, it is clear that the innovations were made possible through salvage, hacking and modification.

Although these examples demonstrate sustainability practices and innovations that work, the effectiveness of these actions and tools to operationalize the rhetorical aspects of indigenous sovereignty remains threatened by rhetorics of colonization. Unfortunately rhetorics by influential colonial institutions continue to miss the point of what indigenous innovations demonstrate. To highlight and address this issue, I will briefly focus on an Internet article published by NASA about the work of a young Navajo engineer.

The issue I will address in the following few paragraphs circulates around an example of “Indigenuity” which is identified, broadcasted, and celebrated in an article by Heather R. Smith (NASA Educational Technology Services). Smith’s article, titled “Junkyard Genius,” is featured on a dedicated webpage located on NASA’s website about a Navajo boy, Garret Yazzie, whose inspiring use of salvaged materials, demonstrates indigenous technological sovereignty. It is no coincidence that NASA, responsible for producing what one hacker, Schwartau, refers to as the “greatest hacking of all time,” has identified what may someday be recognized as one of the greatest indigenous hacks of all time. This correlation is not a coincidence, nor could it be more appropriate. This is because identifying instances of hacking is what hackers often do. In this case one hacker (NASA) is recognizing an instance of hacking (by Yazzie).

Although NASA has done a great job recognizing Yazzie’s achievements, there are issues that need to be addressed with what the agency is and isn’t doing with language in its article about Yazzie in relation to what Yazzie actually achieved and the Navajo community’s perception of his identity and work. To get started, I will begin by presenting Yazzie’s achievement according to Smith’s account.

In 2004-2005, the then 13 year old, Garret Yazzie, was faced with a challenge that linked the energy efficiency of his home on the Navajo reservation with his sister's respiratory health. Garret observed that his sister's respiratory problems, sometimes requiring hospital treatment, were caused by his family's need to heat their home by burning coal and wood (Elthie and Schubert; H. Smith). Garret's family depended on coal and wood to heat their home and well water for bathing. This was necessary because Garret's home, like many homes on the reservation, did not have running water or electricity. By observing his sister's illness in relation to his family's consumption of particular energy sources, Garret identified an engineering challenge and took it upon himself to address his family's need for a healthier heating system.

Responding to the need for cleaner energy, Garret figured out, through salvage, hacking, and modification how to create a solar powered water heater for his family's home. By using an old Pontiac car radiator he found at a junkyard and some aluminum cans, Garret constructed a heating technology capable of heating water to 200 degrees Fahrenheit while raising air temperature by 45 degrees Fahrenheit (H. Smith). Garret's invention, one that connects with the innovation strategies described by "Indigenuity," rasquache, and design-after-design, solved his family's energy needs and catapulted him into the national spotlight (Flowers 178; Nango and Thoresen; Storni 163). Naturally, the Navajo community was proud of Garrett and referred to him as the "Junkyard Genius."

The moniker "Junkyard Genius," is of course in many ways a very poignant way to refer to Garret, as well as to identify and understand his activities. He is an inventor who engineers solutions by salvaging parts from a junkyard. Not only does the identifier

“Junkyard” effectively serve the purposes of representation and comprehension, but it also has a certain ring to it. The important issue about the moniker given to Garrett is that the metaphorical meaning of “Junkyard Genius” within his community takes on an entirely different meaning when appropriated by the media because the moniker is re-contextualized by the media to achieve different objectives than its Navajo originators.

The moniker, “Junkyard Genius” is a powerful news headline, mainly because it packs so much literal meaning about Garrett’s story. It’s also handy for a journalist who benefits from the tension between the words “Junkyard,” often associated with salvaging as a function of poverty, and “Genius” which describes high-level intellect linked with privileges often tied to the upper echelons of society. The tensions between these words create curiosity and beckon a reader to further inquiry. Unfortunately, even though the moniker is a compelling headline for describing Garrett’s identity and activities, it also obscures powerful aspects of Garrett’s identity as well as meanings behind his work.

Within the Navajo Nation, a public that is aggressively engaged in building its entrepreneurial capacities, it is unlikely that Garrett’s nickname the “Junkyard Genius,” was intended to propagate a narrative of poverty to national media. Before the media appropriated the term it may have been used for the purposes of local humor through trickster wordplay, teasing as a display of affection toward Garrett, and exhibiting great community pride in a young kinsman who exhibits a profound literacies prowess. Junkyard Genius is a Navajo moniker that perhaps communicates: “This kid is so good, he can take discarded materials and create something that is once again useful.” Since these arguments are speculative, it is important to maintain a level of complexity by also

acknowledging the possibility that the nickname “Junkyard Genius,” is a Navajo metaphor that additionally embodies values reflecting colonization and hegemony.

In either case and regardless of speculation, it is clear that NASA’s and the Navajo Nation’s use of the moniker “Junkyard Genius” communicate these groups’ perceptions that Garrett is brilliant. The issue that I want to highlight is that NASA’s appropriation of the moniker out of its original context asserts to the greater public that those who live on the Navajo reservation are in poverty. This is a damage-centered narrative, which in the United States comes at the cost of a people’s dignity. When taken way out of context, a “Junkyard Genius” literally means that Garrett is a genius of junkyards. I believe that such a genius could be interesting and amazing, but in this case, Garrett’s genius is not junkyards, but is his ability to invoke the same human spirit of survival that NASA once did as it worked to achieve “the greatest hacking of all time.”

Unfortunately NASA’s appropriation of Garrett’s Navajo nickname does what so many Hollywood movies are guilty of, which is that it has left Garrett’s community open to stereotyping. This, ironically, is exactly what Garrett’s work and other indigenous hacking such as “Indigenuity” and rasquache, are meant to rhetorically mitigate by ameliorating poverty and dependencies tied to colonial oppression.

If we analyze Garrett’s work through the lenses of “Indigenuity,” rasquache, and design-after-design, Garrett’s work isn’t about living in poverty, but instead demonstrates the wealth of indigenous knowledge systems that provide his community with resilience and sovereignty. Garrett reminds us that this wealth is what has sustained indigenous peoples despite the living conditions imposed by colonization. The purpose of

“Indigenuity” and rasquache is not to expose or communicate poverty, but is instead meant to heal people by generating human dignity⁹⁶ through resilience, literacies prowess, aesthetics, survival, resistance, and indigenous entrepreneurship.

Examples such as Garrett’s solar power heater, has inspired me to participate in informal conversations about indigenous hacking during my travels to different parts of the world. Through informal conversations at academic conferences, I began to realize that there was something interesting about the fact that the often disparate and sometimes connected diverse indigenous cultures throughout the world practice similar forms of hacking. Recently, while attending the 2014 Participatory Design Conference in Namibia, I learned about research on technology transfer in developing nations throughout, what the Participatory Design community refers to as, “the Global South.” After investigating this research I came across quantitative evidence that blacksmiths of Tanzania were salvaging automobile suspension coils by hacking and modifying them into farm plows (Müller, “An Other Path” 244; Müller, “Making Ends Meet” 51, 57, 58).

This research describes Tanzanian blacksmith practices similarly to how Joar, from the Arctic, describes what the Sámi are doing with foreign manufactured materials. At the same time, Müller was also practically describing the hacking practices of indigenous peoples of North America, which are practices that I am intimately familiar with, and that I myself practice after having learned how to do so from my own

⁹⁶ The following quotes help to describe what I mean my “dignity.” These quotes are from the book titled *Wasáse* by Taiaiake Alfred. “Anger and hatred need to be overcome and replaced as the motivating focus of our resistance to injustice with courage and determination. Dignity is truly what has been lost in the colonization of our peoples. Dignity is what must be recovered. (175)” “Learning, doing ... reawakening to who we can be. This is the positive sense of self-determination that we need to carry us forward. (175)” This is the spirit that Garret and the other indigenous hackers in this essay show us.

community in Northern New Mexico. While thinking about indigenous hacking, I began to wonder: Why do diverse indigenous peoples from around the world all seem to have nearly identical practices of hacking? How is it that Pueblo communities back home, largely unaware of the Sámi or the Tanzanians, could have such a similar ethos, philosophy, and practice of hacking? Since initially posing these questions, I have developed the hypothesis that these similar practices of hacking among indigenous groups around the world are shared narratives reflecting indigenous experiences of colonization. In other words, the similarities of hacking amongst diverse indigenous peoples are largely a function of the contemporary social, cultural, political, and economic climates that are the shared consequences of colonization.

So far, I have only demonstrated indigenous hacking within the physical realm, and have not demonstrated indigenous examples in cyberspace. Throughout this chapter, I have focused on the indigenous hacking of material culture to build my claim that hacking is an indigenous tradition, and one that, with the establishment of indigenous digital literacies capacities, will be ported into cyberspace and mixed-reality. To illustrate what the indigenous hacking of digital media might look like, I will offer an illustration of my own creation. The following is the result of my own digital literacies skills, coupled with the hacking skills that I was taught by my community.

In the following example I will illustrate a technology that I created through salvage, hacking, and modifying in order to support 5th grade ethno-mathematics learning with a specific focus on fractions, ratios, and periodicity. I refer to this innovation as the *Interactive Mexican Calendar*. This education technology is a low-cost multimodal

experiential media system comprised of custom hacked hardware and software that features embodied digital media learning through face-to-face interaction by multiple collocated participants gathered around a floor projected interactive calendar.

Through a learning curriculum of dialogues and cultural experiences that include talking circles, traditional music, indigenous vocabulary, history, astronomy, storytelling, observations, and Mexica cosmology, students study the mathematics of rational numbers through an culturally contextualized and embodied ethno-mathematics experience.

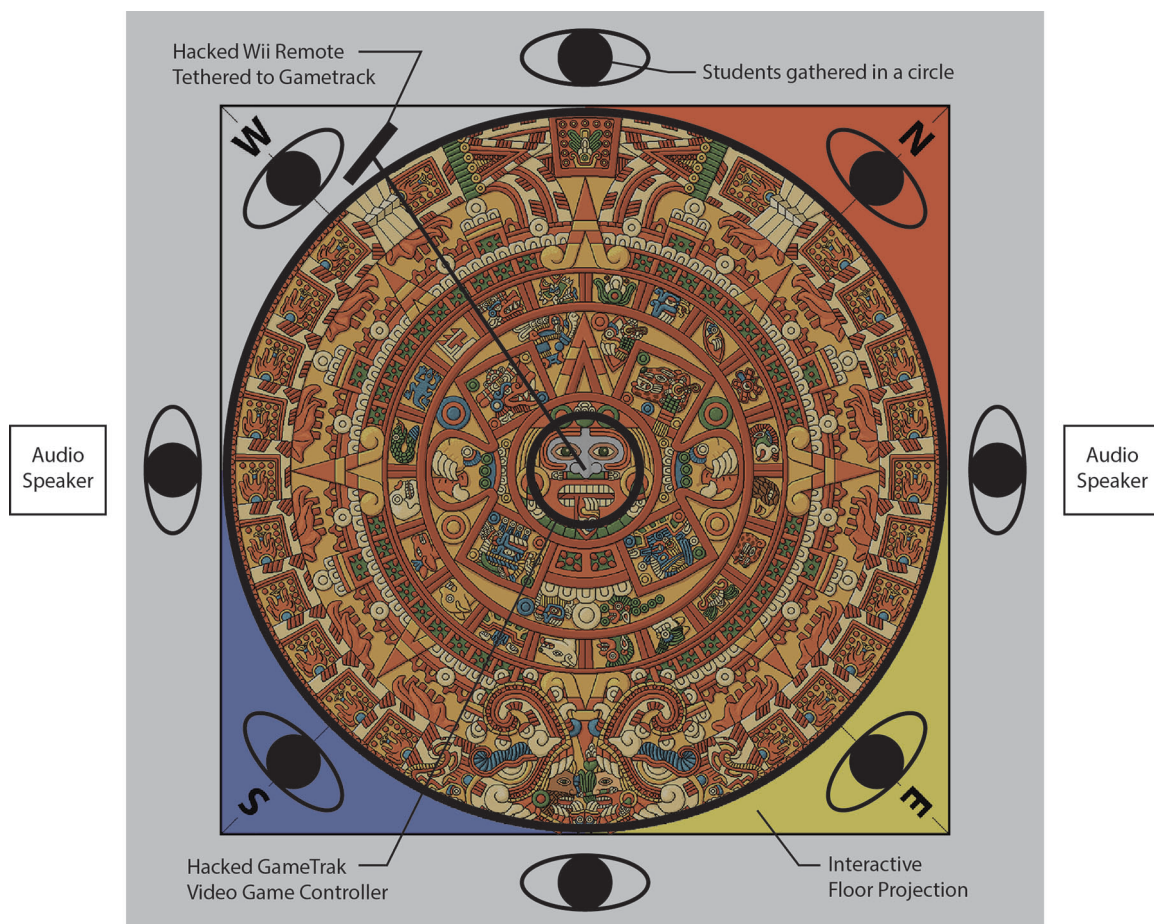


Figure 3: *Interactive Mexican Calendar*, top view diagram

Students use a hacked Nintendo Wii Remote tethered to a hacked Sony PlayStation golf videogame controller in order to interact with the floor projected Mexican Calendar.

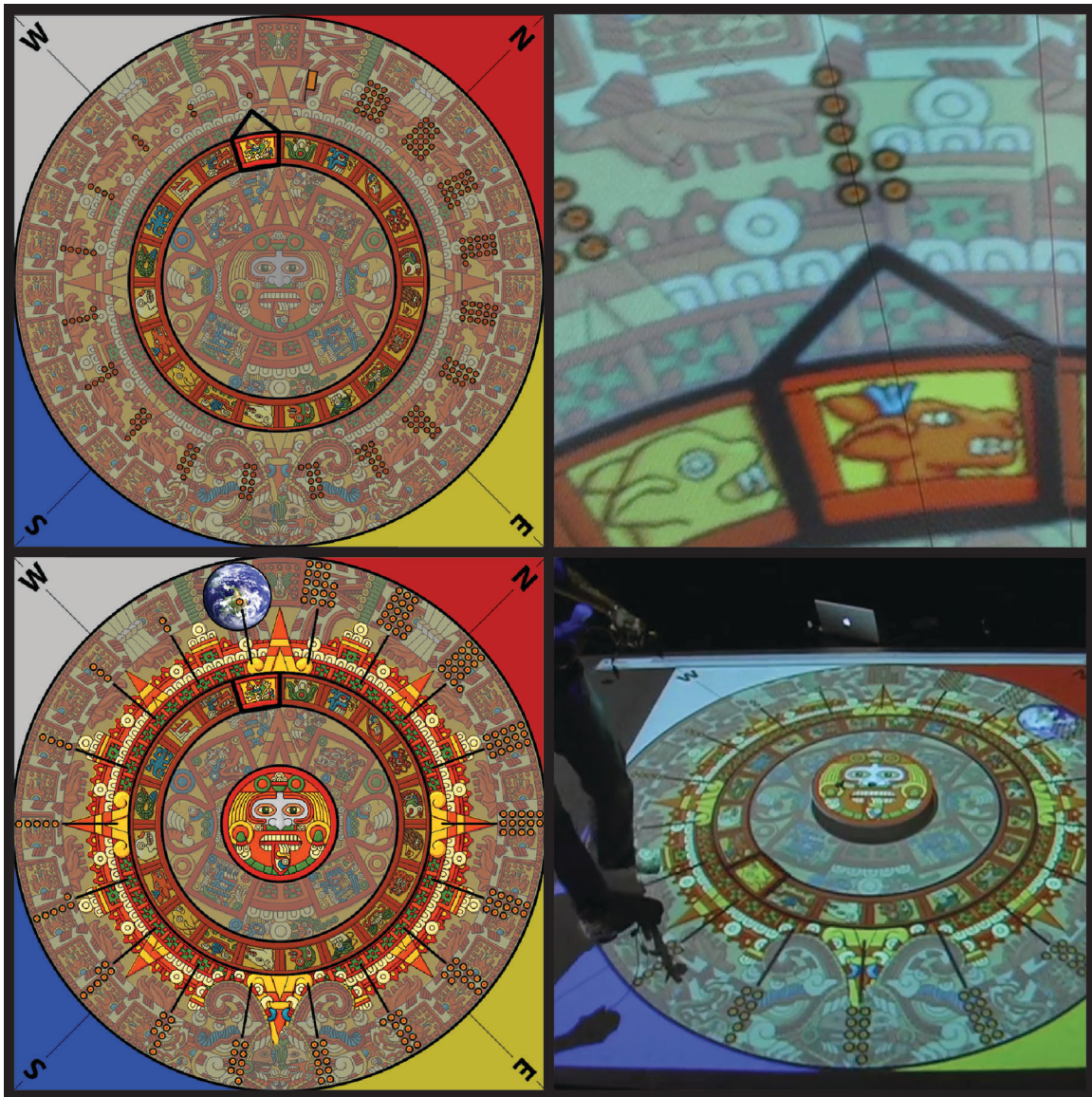


Figure 4: *Interactive Mexican Calendar*, interaction stills and live photos

This culturally responsive learning scenario is comprised of a series of scenes that are designed to teach Mexica based ethno-mathematics through an embodied cultural learning experience. The intention behind this design is to couple indigenous mathematics with standard math curricula for 5th and 6th grade elementary education, and to provide students with a cultural context for learning. While using the Interactive Mexican Calendar, students learn indigenous stories, symbology, astronomy, agriculture, and mathematics, as well as ethics and values. Furthermore they are provided with learning that demonstrates how all these elements connect and relate to each other. By standing together in a circle, students interface with the calendar through a process of turn taking. By doing so, they interact with mathematical and narrative relationships between the Sun, Earth, and Moon.

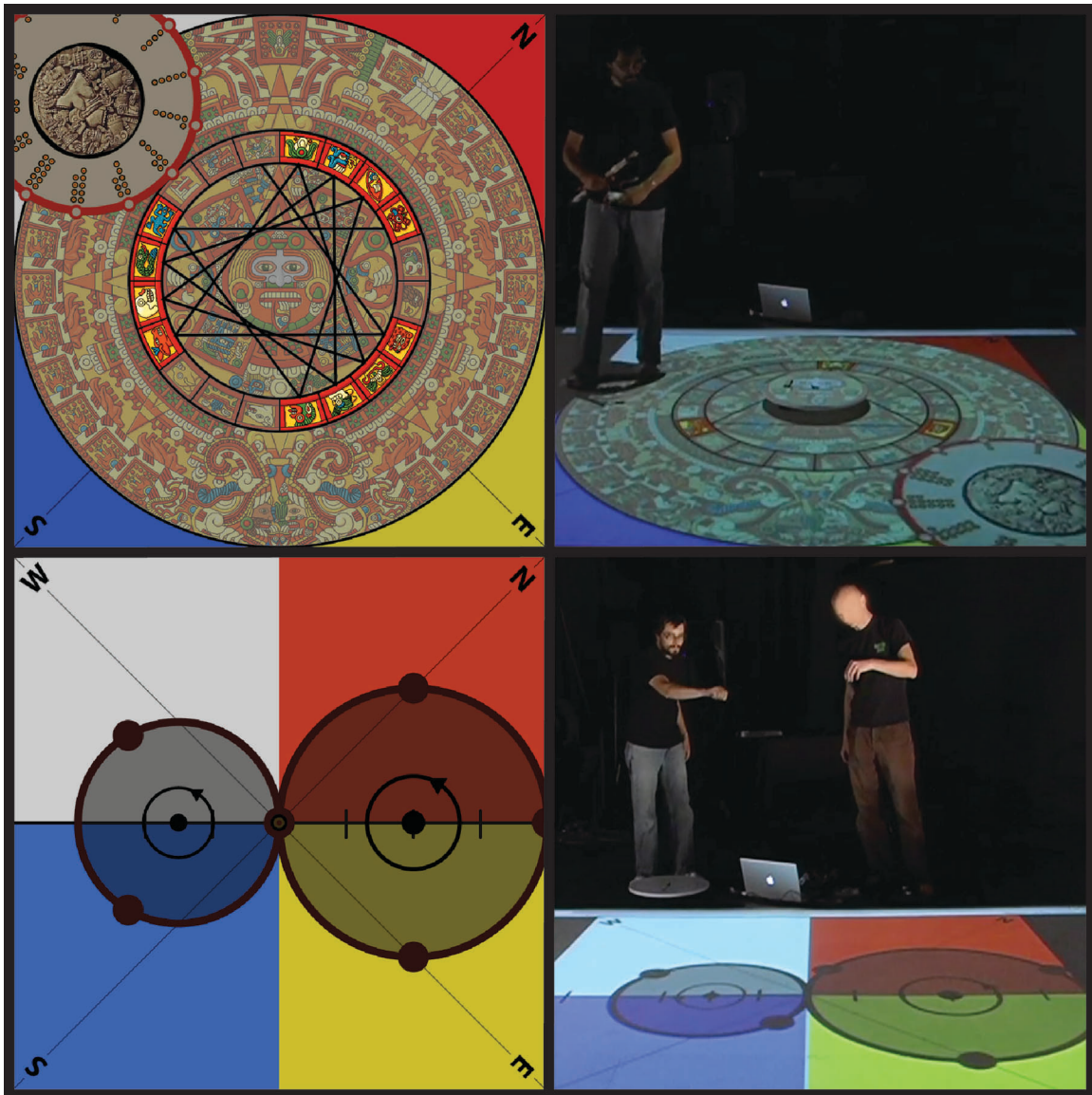


Figure 5: *Interactive Mexican Calendar*, interaction stills and live photos

To create the *Interactive Mexican Calendar*, I drew my inspiration from a mixed-reality learning platform called SMALLab, which is an education technology supported by hardware that costs approximately \$35,000 (SMALLab Learning; “SMALLab Learning Environment”). Inspired by both the creative potential of SMALLab and the fact that it is largely cost prohibitive for indigenous peoples, I decided to re-imagine my own version by hacking a Nintendo Wii Remote, and an obsolescent GameTrak video

game interface designed for Sony's PlayStation 2. By hacking these digital media technologies, I was able to produce a portable education technology with comparable interaction capabilities to SMALLab for the cost of less than \$1,600. The capacity of "Indigenuity" to erase economic borders is precisely what Nango and Thoresen mean when they refer to "Indigenuity" as "... the ability to understand our environment and to improvise, using what you've got, and seeing the value of this" (n. pag.).

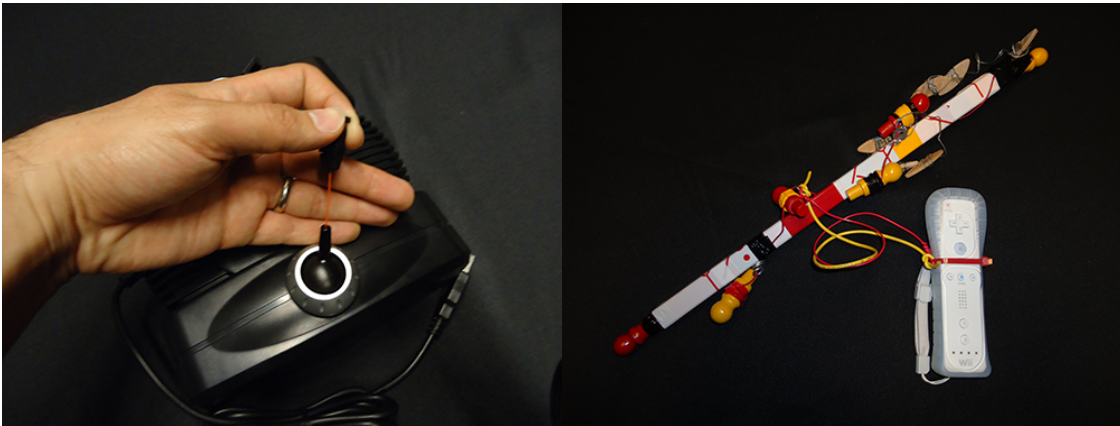


Figure 6: *Interactive Mexican Calendar*, hacked hardware

This hacked hardware is used to produce affordable sensing technologies required for students to interface with the Mexican Interactive Calendar.

In the case of the *Interactive Mexican Calendar*, I was able to mimic the attributes of a very expensive technology (that cost prohibitively erases all who cannot afford it), by taking advantage of the embedded obsolescence of today's digital media. To achieve this, I bought hardware that is no longer in use, similar to what Garrett did with the Pontiac radiator, and I transformed it from a game controller that was originally designed as golf video game into a human computer interface for a culturally responsive indigenous ethno-mathematics education technology at a very small fraction of the cost of SMALLab's motion capture interface. This strategy has also been talked about by

education technology scholar whose name is Johnny Lee. Lee claims and demonstrates that through hacking, a hacker can replicate 80% of an interaction for 1% of the cost! In case of the *Interactive Mexican Calendar*, the cost was much lower than 1% (Lee).

Because the GameTrak controller is now out-of-date, even though it was recently invented only a few years ago, I was able to purchase it brand new for a whopping twenty bucks on eBay. To re-quote Nango and Thorensen, the *Interactive Mexican Calendar* illustrates “Indigenuity,” because it is grounded in “. . . a particular emphasis on ideals of self-reliance, the ability to find creative and innovative solutions on the grounds of limited material resources in local communities” (n. pag.). To revisit Ybarra-Fraustro, the calendar also illustrates what he means by *movidas*, or strategic moves/innovations that are built upon accessible resources, humor, and creativity (133-134). This self-reliance is embedded within the public-memory of indigenous communities. It is this self-determination that operationalizes a people’s power and sovereignty.

Briefly on the topic of tricksters and jokers, there is something humorous about transforming the elitist Discourse of Golf into a tool for making the expensive SMALLab more affordable, just like there is something humorous about Garrett’s ability to build an efficient heater (a medicine for his sister) out of aluminum cans that contained poisonous substances like alcohol and soda ;-). This joker and trickster ethos is common to all hackers indigenous and non-indigenous alike, and represents how hackers articulate their wit, identity, and ethics (Coleman 93-120). This phenomena is most eloquently accounted by hacker ethnographer and hacker ethics scholar Gabriella E. Coleman who states:

This expression of wit solidifies the meaning of archetypal hacker selves: self-determined and rational individuals who use their well-developed faculties of

discrimination and perception to understand the “formal” world—technical or not—around them with such perpeccuity that they can intervene virtuously within this logical system wither for the sake of play, pedagogy, or technological innovation. In short, they have playfully defiant attitudes, which apply to almost any system in order to repurpose it (7).

Joking is a mode of discourse that is often appreciated within many hacker communities through poetic verses encoded into the syntax of computer code, and by indigenous hackers through visual puns like a satellite dish on the Navajo reservation painted to look like a large Navajo Wedding Basket or a car hubcap as Native American war shield (See *Figure 7*). According to many indigenous scholars, the power of humor is also a marker of self-determination and sovereignty.



Figure 7: *Pony War Shield*, by Randy Kemp

This war shield is constructed of an old Ford Thunderbird car hubcap and engraved plastic feathers. By hacking the hubcap, Kemp reclaims the Thunderbird icon.

To conclude, this chapter presents a theory of operationalizing indigenous technological sovereignty through salvage, hacking, and modifying. The implications of this theory are that indigenous peoples themselves will have to extend their traditional indigenous hacking skills to include digital media. In this chapter I have also claimed that indigenous traditions of hacking are prerequisites for the appropriation, transformation, and repositioning of emerging pervasive technologies so that they may reflect indigenous values. I have also implicitly argued that indigenous values are one of the requirements for indigenous self-determination, which is serendipitously convenient, in the case of hacking, since technologies in are encoded with the values of their creators. I have provided contexts for hacking that demonstrate the vast social, political, economic, adversarial, and aesthetic complexity associated to cyberspace and digital media, and have demonstrated the power of this media to impact and transform all forms of sovereignty that were known to us prior to the ubiquity of networked digital media. Today's ubiquitous digital media empowers our abilities to both enhance and erode all forms of indigenous and non-indigenous sovereignty.

As I have narrated many contexts of hacking, illustrated the complex world of hacking and cyberspace, made claims about the transformative power of digital media, and illustrated that indigenous peoples exhibit successful traditions of resistance, survival, and sovereignty via hacking, this chapter, depending on who reads it, may appear haunted by the specter of violence and moral ambiguities associated with hacking.

It is evident according to prominent "Native Sovereignty" scholar Taiaiake Alfred that in some cases violence can be difficult to separate from resistance, and that violence

is evoked by extreme cases of oppression when people feel that there is no other recourse for change (Alfred, *Wasáse* 51-53). By writing this chapter it is not my intention to promote violence or unlawful behavior. When it comes to Tecno-Sovereignty, I believe it is imperative that we learn to remove violence from resistance, and that we remember many great ancestral orators whose words of wisdom evoked justice, power, and dignity in spite of colonization (Armstrong; Vanderworth).

Operationalizing Tecno-Sovereignty through salvage, hacking and modification, is a vision that consists of challenging and serious dialogues and diplomacy that extend hundreds of years of diplomatic traditions by indigenous peoples seeking justice through dialogues with colonists and governing colonial institutions. This vision is not only about dialogues and diplomacy, but a double bottom line action of dialogues and diplomacy through everyday acts of indigenous pragmatism and survival through salvage, hacking, and modifying. It is the craft of survival and the aesthetic essence of the craftsmanship of indigenous hackers that are what defines the spirit of Tecno-Sovereignty.

To appreciate this discourse, we must move beyond imperial and corporate inspired prejudices that hackers are generally criminals. Hackers also possess ethics, and in the United States for example, are extremely dedicated to the integrity of its sovereignty as staunch advocates of the United States Bill of Rights, particularly freedom of speech (Coleman). These hackers are decedents of the original hackers who invented the Internet with the idea that this tool could create a world based on the ethics that knowledge and creativity was free, transparent, and shared (Best 213-220).

Because corporations and governments did not agree, the Internet of these hackers was colonized. These hackers, in an effort to protect their way of life, continue to fight for their beliefs by providing the world with free and open source software (F/OSS) such as the Linux operating system that, in and of itself, can be legally hacked and modified (Coleman). These hackers have assembled into a community built upon ethics, morals and values. Through these ethics, morals, and values they have structured an institution capable of legally defining and protecting their organizational sovereignty as well as the sovereignty of the very forces that threaten them. In the U.S. this seems uncannily similar to Native American sovereignty. The difference is that Native American ethics, morals, values, history, and agendas are different from these F/OSS hackers who remain tied to imperial and colonial meritocratic frameworks (3-4, 120-122).

The F/OSS hackers are relevant at the conclusion of this chapter because they demonstrate a powerful hacker community who work at the site of legal boundaries in order to operationalize and extend their concepts of sovereignty without the need for violence. As an organization they resist corporate interests to silence their voices, and most importantly they are self-determined pragmatists who protecting their way of life.

This ethic of the F/OSS hackers is not all that different from the one I exhibited in hacking digital media to construct an interactive Mexican calendar for learning math. Although the system I built is an open source system, it has an associated hardware cost. Despite the cost of hardware, the interactive system itself is an advancement that made a cost prohibitive technology like SMALLab accessible to more populations who would otherwise be economically barred from access to mixed-reality learning. With a small

grant I could easily build and distribute systems for free to any community who self-identified as interested in using the technology as is, or for any community who wished to hack the system so that it could be made more culturally responsive. The same is true about sharing and accessibility regarding the other indigenous hacks that I have presented in this chapter, this is because the work is about taking pride in one's craft and supporting the identified needs and desires of communities.

The unfolding of events between the U.S., North Korea, Sony and The Guardians of Peace illustrate the powerful tensions placed on sovereignty that are mediated by today's digital media. This new media is bending today's classical national and international legal frameworks in ways that were completely nonexistent three decades ago. Ubiquitous digital media also bends the indigenous paradigms of sovereignty that have been in development since imperial nations invaded already inhabited lands.

To get a sense of the magnitude of changes we all face, consider the following question about one sovereign: How is the United States going to protect its constitution when its citizens are physically somewhere within its borders while at the same time virtually everywhere around the world via the Internet? Sure, the body is in the United States but this person is in cyberspace operating in foreign territory (Lessig, *Code and Other Laws* 21-22). While in foreign territory, this person's behaviors are subject to foreign laws and not those of the United States (with the exception of a few laws). Legal institutions throughout the world haven't even begun to understand this paradox, nor have these institutions considered media and computer science theories which I argue are necessary for lawmakers to understand in order to propose new policies that reflect

citizen value systems. Meanwhile, a minority population such as the Silicon Valley community, who write computer code is coding the laws that govern human behavior on behalf of everyone else with limited government intervention. Most of these computer programmers work for corporations that are designing our everyday lived experiences.

Even though indigenous philosophies of sovereignty epistemologically, ontologically, and axiologically vary from those of the United States, many philosophies of sovereignty are economic and geopolitical. At one of its most fundamental levels, sovereignty is politically based on jurisdictions over land and the self-determined formations of governance within geographic territories or borders. Within the context of geo-political sovereignty, what does it mean for indigenous peoples to be physically tied to their ancestral homelands or indigenous nations via an indigenous way of being, while at the same time virtually everywhere else via the Internet? This question can only be answered by indigenous peoples themselves, and only if indigenous peoples assume responsibility as architects of computer code. It is only then that diverse peoples will be able exercise some control over the politics of our emerging world.

The challenges that indigenous hackers face in assuming roles as architects of digital media, is that they will have to mobilize a critical mass in cyberspace where they can organize and apprentice each other, they would also have to advocate for a vision of education reflecting local indigenous self-determined or culturally responsive pedagogies of Digital Media and Learning (DMAL).

Indigenous DMAL pedagogies might hypothetically include the art of indigenous hacking, computer science, cyber law, local-national-international law, sovereignty, local

indigenous capitalism and other forms of capitalism, critical media literacies, indigenous knowledge systems, local native studies and language arts, and local indigenous ethics of hacking and applying technology. This kind of learning would require indigenous peoples to gain control of, and massively reform the classical colonial models of schooling both within local formal and informal learning scenarios. The challenge associated with education reform is that the classical models of schooling remain a powerful colonial institution in many parts of the world even though much of what is taught has become irrelevant to survival in today's world. According to many indigenous education scholars as well as Digital Media and Learning scholars, the time has come for change.

CHAPTER 5

CONVOLUTION MEDIA, WORKED EXAMPLES OF TECNO-SOVEREIGNTY

Essay 5.1 – Convolution Media: The Old, The New, and The Traditional

The ubiquity of media in the early 21st century is created through arrays of literacies, technologies, and Discourses linked together by communications networks. This media is a dynamic and distributed system whose function is to perform cultural and physical work ranging from Nano to macro spaces, which exist within both virtual and physical environments. Although concepts of the virtual and physical appear dichotomous, as media advances, the distinctions between these two spaces are dissolving. As a result of digital media, including the miniaturization and progressive efficiency of computing hardware, we are currently experiencing an increasingly seamless and ubiquitous mixed-reality world as media advances in terms of speed, accessibility, communications, design, and interface.

Digital media was invented and woven into the social fabric of a significant percentage of the world's human population starting in the late 20th century, and it continues to advance in the early 21st century. Prior to digital media, peoples have invented and used analog media since the dawn of humanity. Many of the reasons for designing and using media remain consistent throughout human history, which are to accomplish cultural and physical work. Media is another word for tools, and although our instincts to create and use tools and languages are a part of what defines human nature, we are currently extending the legacy of our ancestors through practices of media that have radically changed the ways we interact with time, space, and each other.

Our changing interactions with time and space are altering our life experiences and our understandings of what relationships mean. Our evolving understandings of relationships are guided by the ways we interact with each other and with the lands that our architected environments are built upon. As humans, significant changes often require us to adapt, which is nothing new to humanity. However, what is unprecedented for us humans has to do with the current and projected nature of change itself, which is that changes have recently been accelerating as a function of the speed and precision of current technological advances. Now in the early 21st century, today's new media advances will almost quite literally be referred as tomorrow's old media. Accelerating changes are unprecedented on both scales of time and space. A measure of change is based on the high velocity outcomes of accelerating high-speed global networked human communications that are now approaching the speed of light (McChesney 13).

To date, the rate of new media advances is increasing exponentially over time. Changes as an outcome of exponential technological advancement have been a part of human experiences since early human origins. However, the rate of change is now occurring at the steep part of an exponential curve where the density of change is compressed per unit of time. These advances are built from the foundations of analog media, which media theorist Henry Jenkins points out as old media or "delivery technologies" (Jenkins 4-16). These foundational technologies are: the printing press, the telephone, the phonograph, photography, cinematography, and the television.

Despite the fact that these technologies are considered old media, they have proven to be indispensable to contemporary life, and as a result have, since their

inception, been iteratively improved over time. Their improvements are based on the following general criteria, which have been increasingly satisfied over time:

- Production efficiencies increase
- Production quality increases
- Distribution capacities increase
- Distribution efficiencies increase
- Access to reception, production, and distribution increases
- Media ubiquity increases
- Media network growth increases
- Computation speeds and miniaturization increase

The most spectacular advances to the foundational old media highlighted in the first list have resulted from the digital revolution. During this revolution, old media was converted from analog to digital media via digital computation techniques made possible by advances in computer science. The results of this conversion are nothing short of shocking. To illustrate the astounding changes resulting from porting analog media over to digital media, let's take a moment to consider the following: A 19th century printing press required several hundred to several thousand square feet of space in order to support the design and production of a black and white print job such as a newspaper or a book; the telephone during most of the 20th century was large, and required a wired connection; Edison's 19th century phonograph was large and it produced, by today's standards, limited sonic fidelity; throughout most of the 20th century, cameras for photos and cinematography were large, and required large production studios for developing and

editing film; and the television was large and heavy, not to mention the large production facilities required in order to edit programming. Now that all of these technologies have been ported into the digital realm, they are astoundingly compressed into a singular “smartphone” device weighing as little as 4 ounces, which billions of people carry around in their pockets (Jenkins 1-24; McChesney 13).

Not only do our new media provide us with the utilities of the listed old media technologies within the palms of our hands, but they also allow us, with unprecedented power, to instantly and wirelessly distribute our high-definition creations anywhere in the world, and this also includes real-time broadcasting. It used to be that we could only watch television, but now in the early 21st century we can now have access to the television production studio in the palms of our hands, with the capabilities to both produce and broadcast a television show—not just locally, but globally. It used to be that a family would own a phonograph with maybe a handful of audio recordings to play. In contrast, today it is common for people to access just about every audio recording ever published by the music industry with the networked devices in their pockets. The information contained in the past few paragraphs is not a revelation, but illustrates what media theorist Henry Jenkins argues: that old and new media have collided (1-24).

Although the focus of the previous few paragraphs are centered on the technological advancements that bring multiple media functions together into a single miniature appliance, Jenkins makes it clear that such technologies are not primarily what encourage convergences across media to occur. He claims that media, mediums, and economies are the drivers that cause users to seek out the connections between multiple

media functions and platforms (3). He stresses that despite these drivers, it not technology, but ultimately people who form convergences across mediums and media. Jenkins succinctly defines convergence media as “taking place within the same appliances, within the same franchise, within the same company, within the brain of the consumer, and within the same fandom. Convergence involves both a change in the way media is produced and a change in the way media is consumed. (16)”

What is interesting about Jenkins’ theories about media is the assertion that old media conditioned particular social behaviors and types of participation, and that today’s new media is conditioning new sets of rapidly evolving social behaviors, and is expanding participation in ways that groups and citizens are engaging to collectively generate unprecedented power (1-58). Because media was technologically ported over from analog to digital technology with stunning results within the course of a few decades, Jenkins argues that we are experiencing a time when all of these old and new media Discourses are colliding with one another. This is particularly interesting within the context of self-determination and sovereignty because this convergence or ‘collision’ is making it possible for citizens to generate social-cultural-political-economic power through technological capacities that provide individuals and groups with nearly limitless abilities to assert agency within systems that had in the past been closed off to the public. Jenkins provides us with an interesting example of this agency as he presents and analyzes a case study of television in his book *Convergence Culture: Where Old and New Media Collide*.

The author's essay is titled "Spoiling Survivor," and it focuses on a recently popular American TV show called *Survivor* (25-58). This particular television show is usually produced in an exotic location, which varies by season. The show is not scripted as a sitcom, but instead is conceived as a reality game show that creates narrative drama through rules of play, which are designed to empower competition and cooperation among a cast of men and women interacting with each other and their environment. Within their environment, the cast is essentially marooned on location and left to survive for themselves. The processes of survival, requiring cooperation and competition, catalyze various complex relationships and political alliances, which are the subject of consequences that are evaluated by the cast. In *Survivor*, the cast is reflexive because it also forms a jury by which it democratically determines the winner through processes of elimination via jury assemblies that form over the course of a series. To provide incentives for drama, a game mechanic is instantiated to promote competition for political immunity, thus protecting the rewarded player from elimination during a jury assembly. This particular game mechanic is responsible for inciting competition among the cast. What makes this TV show captivating is that it is produced in such a way as to encourage public analysis and critique of the actions and decisions of individuals and alliances.

Before pervasive digital media, it used to be that a television audience had limited agency in the ways that it interacted with television programming. Old media TV was largely a one-way communication system where there were those few people in the world who produced and broadcast messages (or television programming) to the masses —

television viewers were the receivers of these messages. During this time, the producers and broadcasters wielded unprecedented power because they determined the sets of values and representations that influenced millions of viewers (Adorno and Horkheimer; Virilio, *War and Cinema*; Williams 291-300) While viewers received these messages, the ways by which they were able to interact with programming were limited to family and community discourse, which is powerful in and of itself. However, during this time, viewers had no efficient mass communicative power by which to send feedback to the producers and broadcasters, nor did they have an efficient way to commandeer the media, short of mass demonstrations. Furthermore, they lacked the efficient distributive cognitive power available today by which to co-determine messages for broadcasting.

Over the course of time, the scenario of power between producers/broadcasters and receivers radically shifted. With digital media at their disposal, what were once considered “viewers” now became producers and broadcasters as well. The tools at people’s disposal became so sophisticated and accessible that the tools and peoples’ innovations and practices of these tools gave rise to literacies by which average citizens began to illustrate their abilities to generate and broadcast content while often exhibiting better results than corporate and government media professionals (Gee, “The Anti-Education Era” 93-93). The outcomes of this have radically shifted both politics and market economies, which have caused social spheres, corporate practices, and governments to change throughout the world.

In addition to the distribution of power to produce, broadcast, and receive, viewers not only have the capacity to directly interact with television programming, but

as a result of this, they can also actually influence it with great efficiency. It used to be that, during the time of old media, a time when it was considered new, television networks could only measure audience feedback with television ratings, how many people tuned in to their programming, and through severely limited forms of audience feedback. Today, audiences have communications capacities to directly communicate to corporations about their products, as well as production and distribution practices. If corporations don't pay attention to this feedback, they cannot survive because people through their networked communications have the power to pool their collective resources together, and in many cases effectively police media content. In more radical scenarios hacker groups or lone hackers have the power simply to send even more persuasive messages (Carr). The same goes for governments — however, in the case of governments, societies have demonstrated their collective socially networked uses of media to dismantle previously impenetrable political regimes.

Jenkins' case study of *Survivor* shows the power of new media and how old and new media collide by demonstrating how viewers interact and influence television, and how these interactions spawn new types of social organization and the pooling of collective resources or self-organization by citizens themselves. At the same time, producers and broadcasters are strategically engaged with their audiences (Jenkins 26). Those who are producing and broadcasting media are aware of emerging audiences' increasing capability to exert forces that can positively or negatively impact a television network's financial investments. Investment outcomes depend upon how well producers and broadcasters respond to their peer audience of producers and broadcasters. Audiences

who were once limited in their abilities to interact with TV are now so influential within their contributing dialogues with mass media that they clearly participate with increasing speed and efficiency in creating the very programming they consume.

In the case of *Survivor*, a contingent of viewers have formed themselves into a type of hacker society referred to as “Spoilers” who engage the TV show in an effort to predict the winner (25-26). Jenkins explains that the reason why Spoilers are interested in predicting the outcome of *Survivor* is because, when the show airs, it has already been taped, edited, and produced, which means that the actual events have already taken place (25-26). Because the actual events of the show have already occurred by the time the series is broadcasted, the TV producers and cast already know who wins. In a time when power is shifting, there are viewers who want to distribute the power of the producers by obtaining the same information withheld by the producers themselves (28). To generate knowledge, or power, large online collectives form to pool their resources to hack the show in order to support communities of interest where people gather for the purposes of shared problem solving (26-45).

Spoilers are aware that the outcomes of *Survivor* are largely driven by chance. It is not the interest of Spoilers to attempt to spoil the TV program’s conclusion by predicting the outcomes of chance. Instead, they engage in operations perhaps not all that different from espionage and detective work, where they themselves pool their collective intelligence and resources to collect intelligence/clues that provide them with the keys to unlock who will win *Survivor* before the result is revealed on TV (25-38). As a producer, it is imperative to interact with this audience in order to fuel this participation, but at the

same time the outcomes are disastrous if the show is spoiled. Because of this, all participants become locked into an information power struggle well beyond the broadcast content of *Survivor*.

Jenkins provides us with a few examples of how Spoilers operate, which center around the scholar's theories of participatory culture. What is significant about Spoilers is that they do not operate as individuals, but instead as collectives who pool their resources together (25-43). In many cases, all participants have opportunities to make contributions, and these contributions are largely determined by particular skill sets and resources that participants have to offer the larger Spoiler community (26-28). By pooling their skills and resources, Jenkins argues that the Spoiler community becomes a site of collective intelligence built upon a kind of distributed cognition where “. . . people harness their individual expertise toward shared goals and objectives. (26)” Jenkins cites the work of collective intelligence scholar Pierre Lévy, who refers to this collective intelligence as knowledge communities that in the case of *Survivor*, together are able to exert a greater power in their dialogues with television producers.

Some examples of the individual expertise brought to the knowledge community includes: topography, computer hacking, spying, video analysis, photo analysis, and discourse analysis. Within the spoiling community, some individuals study satellite images to try to ascertain the location of where *Survivor* was filmed; others will analyze interviews featuring producers or cast members for clues; some will hack computers for information; some will spy or are perhaps moles; and others will review manuscripts from speech to try to reveal what uses of language might be hiding or revealing (25-38).

By bringing all of the puzzle pieces together over the Internet, Spoilers attempt to use all their relevant assets to spoil *Survivor*. Throughout the show's life, Spoilers sometimes achieved success, while other times they failed to discover the show's winner. One of the significant implications of these communities is described by Jenkins as “. . . held together through the mutual production and reciprocal exchange of knowledge. (27)” Jenkins later goes on to quote Lévy, who describes these knowledge communities as sites for “collective discussion, negotiation, and development. (27)”

Jenkins' case study of television demonstrates the shift in power as a major change, which has resulted from the emergence of new digital media. These particular shifts are interesting within the contexts of indigenous sovereignty, because they demonstrate the possibilities by which indigenous peoples can also use digital media to harness power, to be self-determined, and to operationalize their sovereignty. Jenkins turns to Lévy to highlight the implications of this new power by bringing to our attention that the types of organization and participation brought to *Survivor*, can just as easily be pointed towards governments and corporations as a way to regulate political and economic structures (29). In the case of indigenous sovereignty, such power is an opportunity to work alongside the nation-state or economies, while at the same time challenge oppressive regimes, discourses, and policies. This is a process that, for example, within the United States may be essential to restoring the hundreds of treaties with Native American nations that have been broken by the United States government.

Relevantly connected to the convergences described by Jenkins is the idea that “mutual production, reciprocal exchange, collective discussion, participation, and

negotiation” are also some of the defining principles of indigenous knowledge systems, and are principles by which indigenous peoples have generated indispensable relationships to land and each other for millennia (27). At the same time that there are Internet cultural models, or digital cultures that appear to reflect indigenous media and knowledge systems (values), Jenkins states that disconnections to physical geographies are part of the changes people are experiencing today (27). While many indigenous peoples may experience disconnectedness to physical geographies, indigenous communities in general continue to struggle, resist, and fight to maintain their relationships to physical geography. If this relationship is diminished, it is mostly due to the affects of colonization, such as peoples being forced to relocate and cede lands.

It is unclear if Jenkins implicates new media as part of what he argues to be people’s disconnection to physical geographies, but, regardless of the case, his theory does not account for how a collective intelligence such as what is exerted in a dialogue within popular culture might translate to the operationalization of indigenous sovereignty, or to repatriate or strengthen connections to physical geographies. He does however, and as stated earlier, clarify that there is an undeniable power associated to collective knowledge groups who are using emerging media technologies to pool their resources toward collective action. Going back to relationships to physical geographies, connections to lands and places remain essential to indigenous worldviews, and will likely become increasingly important for all of humanity as we are forced to adapt to our local environments due to climate change.

Jenkins' theory of "convergence culture," the place where old and new media collide with each other, is a theory based on his analysis of Internet phenomena within social, cultural, economic, and political contexts. In the case of his chapter on spoiling, Jenkins focuses on people who are afforded the privileges to spend their time on pursuits such as spoiling a TV program. For the purposes of indigenous sovereignty, Jenkins' theory must also be extended to narratives that account for people's relationships to physical geographies, simply because places and lands matter within the context of indigenous sovereignty. Furthermore, Jenkins' work must be extended to account for the lack of access to digital media within indigenous communities, and it must also account for the colonial and emancipatory potential of digital media within indigenous communities when access is available.

There are many theories of media by which to focus within the context of indigenous sovereignty and self-determination. Jenkins' theory is particularly useful because his focus of media investigates the idea of participation, which connects to indigenous cultural values and collective actions stemming from respect, reciprocity, relationships, and responsibility (Brayboy et al. 423-424). Within Jenkins' analysis, these values are often salient within certain ideal conditions occurring within what he refers to as participatory culture⁹⁷ (Jenkins 3, 331). I would also argue that similar phenomena takes place within indigenous communities, where there are times and conditions when these values are more successfully observed, just as there are times when they are not.

⁹⁷ Participatory culture occurs when ". . . consumers are invited to actively participate in the creation and circulation of new content. (Jenkins 331)"

Within frameworks of indigenous sovereignty, concepts of Jenkins' theory of "convergence culture," such as ". . . the mutual production and reciprocal exchange of knowledge," at the sites where old and new media collide are of central relevancy (27). However, there are contrasting ideas at play when it comes to collectives such as Spoilers, and an indigenous community. Collectives such as Spoilers assemble as communities of interest, meaning that these communities are comprised of people who participate and contribute labor that is motivated by their individualism, which is often tied to factors such as identities and interests.

Jenkins adds that as these identities and interests shift, as people are constantly leaving and joining other communities of interest while also belonging to multiple communities of interest at the same time (27). In other words, online communities of interest are constantly and dynamically forming and reforming new membership. In the case of indigenous peoples, the existence of communities is not based on changing interests, but is instead bound to values tied to kinship. Furthermore, in cases of kinship, it isn't only the goals and objectives of the group at stake, but the relationships and all that is embodied by relationships that are struggling to survive.

Indigenous kinship structures are very different from cultures structured by a popular culture designed with embedded obsolescence. For example, it is a given that *Survivor* will not survive beyond a certain number of seasons, while, in contrast, for many indigenous peoples cultural life ways are at stake, which include things like languages, food systems, stories, ceremonies, medicines, and lands. For indigenous peoples in general, unlike the show *Survivor*, the objective is survival and continuance

that comes with legacies of millennial histories that demonstrate this accomplishment. Because of this difference, convergence culture for indigenous peoples might look more like a convolution culture: for the operationalization of indigenous sovereignty, the convergence of old and new media are convolved with indigenous traditional media, such as traditional ceremony and the tools or media used to mediate ceremony.

An example of this might be a communication tool such as a talking stick, which is a semiotic vehicle, a vehicle of the sacred, and a metaphor by which, together with ceremonial protocols for speaking and listening, represents an indigenous innovation for communication, dialogues, decision making, storytelling, and diplomacy. Imagine what happens to emerging pervasive media and old media once they are convolved with the values and principles embodied by tools such as the talking stick. My argument is that, through indigenous convolution media, we begin to see the emergence of a culturally responsive indigenous media that empowers both local indigenous inter-community and global cross-cultural indigenous communications.

By relating indigenous traditional media to theories of old and new media, we can perhaps begin to see alternative participatory cultural phenomena tied to indigenous values, assumptions, and objectives. In this chapter I will bring a theory of convolution media into focus by presenting specific exemplars of media that stem from indigenous knowledge communities who model technological self-determination and provide working examples that suggest how an indigenous technological sovereignty might be operationalized. The following working examples model indigenous collective actions

that extend Jenkins' theory of media and demonstrate practices of an indigenous convolution media in ways that specifically connect with indigenous sovereignty.

Through expressions of indigenous convolution media, it isn't just that old and new media are colliding, but that indigenous traditional media is also converging. Today indigenous sovereignty is, in part, being operationalized by the convergence of old, new, and traditional indigenous media, which I refer to as indigenous technological sovereignty. Indigenous convolution media is the technological self-determination of media largely grounded by indigenous knowledge systems, so that these knowledge systems themselves may circulate within indigenous communities. In addition to indigenous knowledge systems, indigenous convolution media also accounts for a history of colonization and ongoing colonization.

All of the following worked examples are created by indigenous intercultural collectives, which are like the knowledge communities described by Jenkins. These problem solving collectives are similar in that they are learning and knowledge communities who pool their multidisciplinary resources and skills together for learning, and to achieve particular goals and objectives. The sharing of knowledge and practices allows these groups, not only to achieve goals and objectives, but also to strengthen their relationships to each other by increasing their distributed literacies capacities.

One of the threads that makes the work of these indigenous arts and technology collectives unique is that, unlike the communities of shared interest described by Jenkins, the indigenous collectives featured in the following exhibition of worked examples is the use of networked communications technologies to mediate interactions with each other

with the end goal of producing social gatherings that occur in physical space. These gatherings include the assembly of the collectives themselves, public assemblies, or gatherings of both. These gatherings are a function of indigenous worldviews where interactions between people in relation to the physical places they inhabit are an important cultural value.

The following worked examples of art and engineering demonstrate indigenous acts of self-determined resistance, diplomacy, rhetoric, politics, literacies, ceremony, innovation, entrepreneurship, and representation. These actions by indigenous art and technology collectives demonstrate complexity within various colonial contexts that subvert indigenous stereotypes and operationalize indigenous sovereignty. The forms of indigenous sovereignty generated by these collectives do not represent a geo-political indigenous community, but they do demonstrate the sovereignty of the collectives themselves who operate in relation to the geographies their work engages. In addition to the working examples they produce, their small-scale collective sovereignty is of significant relevance because these artist and technology collectives themselves are working examples of groups that are modeling Indigenous Technological Sovereignty.

Complex and diverse actions by indigenous peoples throughout colonization define indigenous sovereignty in the Americas, which is for the purpose of surviving colonization and resisting colonial assimilation through self-determined governance. In these worked examples, mediums are fluid, meaning that human interactions and experiences with media continuously circulate across multiple platforms of physical and electronic media. The following worked examples extend the fluidity of this media,

referred to as convergence culture, with the added dimension of indigenous traditional media, which, again, forms what I refer to as Indigenous Convolution Media—the place where traditional indigenous media collide with old and new electronic media.

In all of the following worked examples, indigenous artist and technology collectives produce indigenous re-imagined ceremony through emergent cultural practices of indigenous convolution media. This includes place-making, story-work, performance, theory-making, metaphor, social networking, dialogues, and building public memory. All of these examples are designed and positioned to influence public perceptions, corporate practices, and government policies as rhetorics of community engagement. These worked examples are not forms of activism in the sense that they campaign for a specific change, but are designed to catalyze change by empowering public dialogues and local self-determined actions regarding indigenous exigencies that are epistemic to all peoples.

The purpose for the following exhibition is to highlight worked examples through photo documentation and their quoted associated statements, which includes co-authored descriptions of academic research, as well as didactic texts or artists statements. The documentation and associated statements themselves reveal the assumptions and approaches of the artists, engineers, and academic researchers who have produced the following worked examples. Since I was involved in the collaborative production of these works, I will at times, provide additional texts to explicate some of what might otherwise be hidden logics or “stories behind the stories.”

The following worked examples demonstrate the operationalization of several aspects of indigenous sovereignty, but do not account for all of its complex aspects, which would require an exhibition of extraordinary scope exceeding the limitations of this text. The purpose of this exhibition is not demonstrate examples of work that embody all aspects of indigenous sovereignty, but to demonstrate a vision toward the operationalization of Indigenous Technological Sovereignty through a few examples that address a few aspects of indigenous sovereignty. The following worked examples focus on: indigenous entrepreneurship, governance, narrative, critique, diplomacy, and learning. Each worked example, a total of 11, presented in the following exhibition address the aforementioned topics. Although all of the worked examples engage all of the aforementioned topics, I will parse them in accordance with each topic to explicitly render certain features of these works.

The following exhibition is titled *Convolution Media: The Old, the New, and the Traditional*. All of the following examples of indigenous convolution media were created through processes of salvaging, hacking, and modifying virtual and physical mediums and media.

Worked Examples – Indigenous Entrepreneurship: Salvage, Hacking, Modifying

Mother, Teacher, Destroyer – 2011, by Postcommodity



Figure 8: *Mother, Teacher, Destroyer*, by Postcommodity. Installation view

Four-channel video with sound, mixed media sculpture. Duration: Infinite loop. (Wood, deer antler, deer hide, boar bladder, found materials). Installation view. Close Encounters: The Next 500 Years, Winnipeg, CA. *Photo by Postcommodity.*

Artist Statement (Chacon, R., Twist, K., Yazzie, S., Young, N., with minor technical support and rhetorical contributions from Martínez, C.):

Mother, Teacher, Destroyer presents four women from surviving Indigenous nations that have hacked foreign (colonizer) artifacts and technologies to create culturally sensible implements for the purposes of survivance and resistance. Although the design of the instruments in Mother, Teacher, Destroyer may appear crude or absurd, they are highly functional and articulate representations of prayer and cultural self-determination; tools of Indigenous women's will to sustain Indigenous ways of being. With their instruments, the women have forged a new form of tribal music from the shards of an apocalyptic history, and in the process they have saved and reclaimed the essence of their cultural and spiritual identities. Mother, Teacher, Destroyer functions as both a shrine and memorial to the spirit of these cultural heroes, and a means of honoring the future forms of Indigenous resistance.



Figure 9: *Mother, Teacher, Destroyer*, antler harp player, by Postcommodity. Video still



Figure 10: *Mother, Teacher, Destroyer*, antler bass player and drum player, by Postcommodity. Video stills



Figure 11: *Mother, Teacher, Destroyer*, synth player, by Postcommodity. Video still

Figures 9-11 are still images taken from the installation titled *Mother, Teacher, Destroyer*. These images illustrate women playing instruments created through salvage, hacking, and modification. *Figure 9*, features a woman performing an antler harp constructed of antlers, deer pelt, electric bass guitar strings, electric bass guitar bridges, and a contact microphone connected to signal effects processors (distortion and reverb) and a guitar amp. The antler harp is performed by actions that include tamping and scraping the antlers on the ground. *Figure 10 (left)*, features a woman performing her antler bass constructed of antlers, a BC Rich bass guitar, and a guitar bridge constructed of turnbuckles. This instrument is performed while plugged into signal effects processors (distortion and reverb) and guitar amp. *Figure 10 (right)*, is an image of a woman performing a water drum constructed of animal hide, beads, and an old coffee can, and in

Figure 11, a woman performs an electronic sound synthesizer constructed of a cougar pelt that has been wired with sensors and sound generating electronic circuits connected to signal effects processors (distortion and reverb) and guitar amp.

In this worked example, Postcommodity critiques natural history and cultural museum dioramic representations of indigenous peoples by creating its own diorama. This art installation appropriates and hacks a colonial medium of representation as a way to reclaim indigenous representation. In *Mother, Teacher, Destroyer*, the collective leverages creations of its own representations to produce indigenous counter narratives that challenge the Judeo-Christian Scientific Worldview implicated in creating idyllic, pastoral, romantic, absurdist, and hyper-sexualized (objectified) museum portrayals of indigenous peoples. At the same time, the collective's discourse highlights systems of indigenous capitalism that resist colonial damage-centered assertions of poverty, dehumanization, and assimilation via resourceful, disruptive, and ceremonial innovations.

This particular installation represents a conflux of traditional knowledge practice, digital media, computational video synchronization algorithms, electro acoustic instrumentation, video projection, deer antlers, and animal hides repatriated from urban pawnshops. *Mother, Teacher, Destroyer* was created using a suspended Plexiglas cube filled with fog produced by a fog machine, and four videos depicting each of the women featured above, which were projected onto each side of the cube. Together the women are exhibited playing a concerted noise music abstracted from interpretations of traditional songs. This music permeated the installation, while the instruments themselves were presented as artifacts along the periphery of the gallery.

Radio Healer – 2006 to Current, by Radio Healer



Figure 12: Musical jar top and side views, by Radio Healer

Radio Healer electronic instrument (canning jar, circuits, computer code, and microcontroller). This device plugs into an audio amplifier and is performed by adjusting potentiometers mounted to the jar's lid. *Photos by Cristóbal Martínez.*

Artist Statement (Esler, R., French, J., Kemp R., Kemp, R.G., Martínez, C.):

Radio Healer is a collaborative expression of music, story, and dance, which includes the use of indigenous electronic tools, hacked musical instruments, and traditional ceremonial implements. Indigenous electronic tools are created and used in Radio Healer to practice indigenous knowledge and cultural traditions for performances of re-imagined ceremony. Radio Healer is a community engagement practice designed to generate local community dialogs that critically engage pervasive media. To prepare performances, project artists apply Chicana/o rasquache and Native American adaptive reuse traditions as an innovation methodology and method for the design, construction, and practice of indigenous media. These traditions demonstrate appropriations and adaptations of foreign cultural artifacts and materials, as well as the use of local materials to innovate a subversive economy of functional and aesthetic designs based on cultural ways of being, learning, valuing, believing, and acting upon the world. In Radio Healer, rasquache and Native American adaptive reuse traditions are applied to the aesthetic and functional design of indigenous electronic tools, which are constructed through economical processes of hacking that include: circuit-bending, appropriation, recycling, adaptive reuse, and creative improvisation.

Within *Radio Healer*, rasquache and Native American adaptive reuse traditions are a site of indigenous self-determination—a site of appropriated pervasive/mass-produced artifacts and materials whose originally intended functional, symbolic, and aesthetic purposes are re-designed and repositioned to serve the artist collective’s needs, desires, and values (Refer to *Figures 12, 13, and 14*). *Radio Healer* is a re-imagined ceremony, which is achieved by grounding the innovation and use of electronic technology within indigenous knowledge systems. "By using local community literacies and knowledge systems, indigenous artists appropriate, re-form, re-think, re-imagine, and re-position market driven consumer electronic technologies to innovate culturally-responsive applications that expose otherwise hidden technology ideation processes. Using these tools for performance, *Radio Healer* encourages local communities to critically engage media. (Radio Healer, “Statement”)"



Figure 13: Native American electro-acoustic flute performance, by Radio Healer

Artists perform Native American flute, electronic circuits, and Mexican rattle. *Photo by Lee Hyeoma, 2011. Pueblo Grande Museum, Phoenix, AZ.*



Figure 14: Hacked Wii remote performance, by Radio Healer

This photo demonstrates an instrument that uses a hacked Nintendo Wii Remote game controller. Here the Wii Remote rotates around a ball bearing apparatus, producing acceleration features that control the playback characteristics of audio samples. *Photo by Lee Hyeoma, 2011. Pueblo Grande Museum, Phoenix, AZ.*

Radio Healer is an indigenous cross-cultural performance. It is a project largely comprised of artists belonging to several distinct North American indigenous peoples including Native American Nations and Chicana/o communities. Performances of the project are situated within the context of Phoenix, Arizona, a borderlands metropolis that includes numerous historic Mexican-American communities, while surrounded by over 20 Native American tribes who have continuously inhabited their ancestral homelands

since time immemorial. Within Arizona, *Radio Healer* is also a project in residence at the Pueblo Grande Museum located in the heart of Phoenix.

During *Radio Healer* performances, indigenous electronic tools (many of which are created from salvaged materials and hacked Nintendo Wii Remotes) are performed together with traditional indigenous instruments. The convergence of traditional and contemporary indigenous instruments demonstrates a will to overcome the value-laden tensions between notions of what is considered traditional and contemporary by illustrating that traditional and contemporary technology can connect to each other in useful and meaningful ways (*Figures 12, 13, and 14*). By creating this rivaling complexity, *Radio Healer* provides an indigenous ground for inclusive public dialogues. As performances come to an end, the artists open up dialogues that provide opportunities for audience interpretations of the performance, which often unpack *Radio Healer* as a metaphor for various lived experiences within the contexts of place, connected-knowledge, relationships, indigenous knowledge systems, and pervasive media.

Through a deep awareness of place and peoples, *Radio Healer* creates interactive electronic implements grounded by indigenous knowledge systems and cultural practices within the context of place and the digital age (*Figures 12, 13, and 14*). To create these tools for re-imagined ceremony (music, dance and storytelling), the artists apply Chicana/o rasquache and Native American adaptive reuse traditions (*Radio Healer*, “Abstract” 2010). Using adaptive reuse traditions as an innovation framework, *Radio Healer* artists appropriate, salvage, and re-adapt foreign cultural artifacts and materials to create local functional, symbolic, and aesthetic designs reflecting local indigenous values.

In *Radio Healer*, indigenous knowledge systems are applied to the design of electronic tools constructed through a process of hacking, circuit-bending, appropriation, recycling, adaptive reuse, and creative improvisation (Martínez, Kemp, and Tolentino, 2010; Ybarra-Frausto, 1991).

Radio Healer demonstrates a vision of indigenous media for the construction of representation, the ongoing emergence of cultural traditions, and for indigenous self-determination. It is a rhetorical public engagement project by an intercultural group of indigenous peoples who are considering the colonizing potential of digital media, and the appropriation of this powerful and malleable medium as a way for indigenous peoples to respond to the needs and desires that they identify for themselves.

Radio Healer is a performance work reminding us that indigenous peoples are not a concrete and unified group, but instead reflect a vast diversity of peoples throughout the world. Not only does *Radio Healer* reflect upon the theme of cross-cultural connectedness among diverse peoples, but it also shares a vision for broadening participation in a digital age. Broadening participation is a concept “reflecting connectedness” to all peoples, and for many indigenous peoples these reflections must also account for co-intentional and reciprocal relationships capable of rationalizing and actively participating in change. The purposes of these disruptions are not to promote change through violence, but through peaceful co-intentional dialogues and action for constructing more equitable and self-determined publics.

Worked Examples – Governance: Re-Imagined Ceremony for Social Gatherings and Community Dialogues

Game Remains: Golden Horseshoe (Guelph) – 2013, by Postcommodity

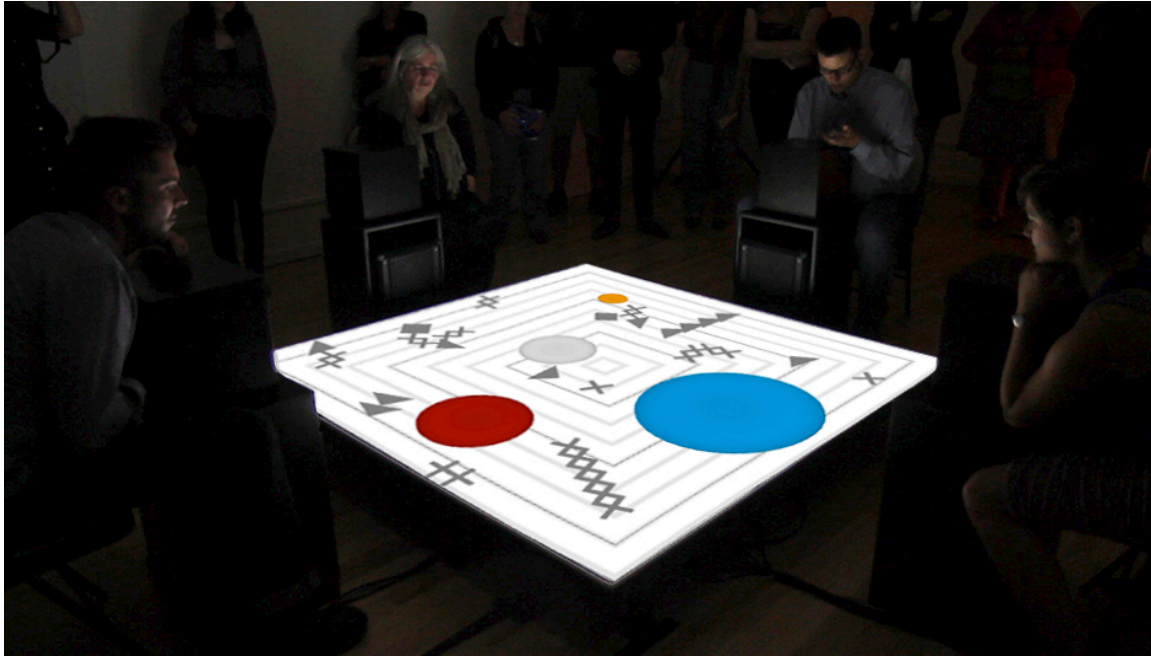


Figure 15: *Game Remains*, Guelph performers, by Postcommodity. Installation view

Generative sound performance, installation and socially engaged collaboration.
Installation view. Musagetes Guelph Café, Guelph, Ontario. *Photo by Postcommodity.*

Artist Statement (Chacon, R., Martínez, C., Twist, K., Young, N.)

Game Remains combines video game technology with community collaboration to create a site-specific, generative, music performance and installation environment. Utilizing a ceremonial conceptual framework, collaborators engage a significant community issue and co-determine a set of values and protocols to guide the logic and interactivity of the game in a manner that best articulates a shared vision of community agency. This vision is then fully integrated into the game-based immersive environment enabling participants to understand each other's intentions and actions through multi-modal feedback. With the aid of a ceremonial filter, the game transforms participants into musicians engaged in a community instrument of self-determination with the ability to abstract the social, political, and economic characteristics of their locality, and collectively imagine and sonify a more desirable future. Game Remains critiques computational simulation models and their uses for consensus building, strategic planning, policy development, positioning bodies, enacting violence, and advancing 21st century processes of colonization and globalization.

The technology for this interaction is grounded in Indigenous Knowledge Systems, and designed to teach players about indigenous concepts of ceremony and dialogue based upon protocols for turn taking, working together, and deep reflective listening. A feature of this installation is its ability to contextualize itself within the places it is installed. By entering into a relationship with place, *Game Remains* becomes a platform for the design of game mechanics that are based upon ideas, perceptions, and data that players embody about the places they inhabit. By working together to formulate consensus about place and community development, players/musicians are able to engage in social political dialogues with each other to prepare the game and themselves for gameplay in ways that reflect a sense of place and ideas about its future.

Game Remains is an installation with a video based interactive space that is projected onto a slightly inverted pyramidal structure mounted to the floor. The interface includes the use of four flight simulation joysticks that are appropriated and hacked to support a four-person interaction. Each joystick is assigned to a player, and is mounted to the top of one of four speaker cabinets. Together these speakers and game controllers are situated around the pyramid so that the audio is projected locally around the video interaction space. In addition to these audio monitors, there are four audio speakers mounted to a canopy above and along the periphery of the installation. This 8-speaker surround sound system is designed to help enhance the immersive experiences of both the players and members of the audience who gather in a circle around the interaction. The audible display of *Game Remains* allows sound to be projected both locally and from the

ambient periphery, resulting in an immersive sonic experience for both player-musicians, and the audience.

The software for *Game remains* was written and play-tested by Postcommodity, and it features modular variable inputs that allow the collective to adjust game mechanics and sonic timbres to reflect the shared values articulated through a series of community development workshops that take place prior to the performances. These workshops can be thought of as music performance rehearsals. Through the process of rehearsals and gameplay, *Game Remains* transforms participants into musicians co-engaged in the performance of a community instrument that is designed to sonify efforts at achieving local social and political consensus.

Game Remains infuses a videogame with generative music that participants compose and perform together. Postcommodity led the design and engineering of *Game Remains*, an interactive floor-projected installation that infuses a video game with generative music that participants compose and perform together. Postcommodity's installation considers the development and implementation of a game as an instrument for dialogue, both as a social tool and a shared interface for music performance. This 8-channel surround sound installation is not a video game with a sound track, but instead is a video game, which through game play produces a generative experimental sound and music composition. In other words, the video game is a musical instrument requiring the collaborative efforts of four people in order to compose and perform improvised music.

The Story of implementation in Guelph (Martínez, C., Ingram-Goble, A.)

In September 2013, Postcommodity was invited by the Musagetes Foundation, a non-profit international organization that promotes the arts for the purposes of social transformation, to contribute to their annual Guelph Café. According to the Musagetes website, The Guelph Café is a, “. . . a momentary metaphorical public space for participation and discussion about the meaning of culture and community building.” The dialogues facilitated by Musagetes included guests who are local municipal figures, cultural organizers, artists, writers, and musicians. In addition to these local participants, an international guest, Postcommodity, was also invited. Initially upon receiving an invitation from Musagetes, Postcommodity, in accordance with its methods for artistic creation, began to research and learn about the city of Guelph. To construct a picture of the city, the collective researched data about local economy, population demographics, immigration statistics, political structures, local government policies, and city planning documents. In addition to this data, the collective also researched a general history of the founding and development of Guelph.

This methodological approach for producing art guided Postcommodity to consider its position as guests in the city of Guelph. The logic of this positionality led to consensus within the collective to contribute to the Musagetes Guelph Café, a social practice work of art that fosters a relationship building process between the collective, as guests, and citizens of Canada who live in or near Guelph. To achieve this, Postcommodity began to apply its research on Guelph to develop a site-specific work of

art imbued with the capacities to empower a several day self-determined dialogue, between 8 local participants, about imagining a more desirable future for Guelph.

After reviewing the nature of the Café, Postcommodity developed a social practice piece titled *Game Remains* to strategically position itself within the Café dialogue. It achieved this by creating a work extending the intentionality of Musagetes' vision for the Café, which was to encourage outcomes of co-created work as the result of collaborative processes. Musagetes, citing a panel discussion by a group of local citizens, describes their notion of co-created work as characterized by: “. . . dialogue, improvisation, and dispersion of ideas and resources across varied groups that might not otherwise be possible” (Firth-Eagland, A., 2014). The idea for *Game Remains* is that the values generated by Guelph citizens, through a process of dialogue and consensus building, via structured workshops facilitated by Postcommodity, are then used to build a series of protocols that would eventually drive the logic of a generative sound performance via a video game inspired interactive digital media installation.

By abstracting their consensus through game mechanics design and game play, participants are able to perform abstract expressions of sound art that represent their shared perspectives with their fellow citizens during a live public performance. As a result of their performance, the participants were able to then enter into a new dialogue with the audience about the meaning of their work. As a result of the process of achieving their own public engagement, participants, who were initially strangers representing many different interests, developed meaningful relationships with each other. This was a particularly striking outcome to Musagetes, as the organization observed the participants

socializing with each other in ways that demonstrated a sense of closeness and community, furthermore, the groups' consensus' led to the articulation of their desires to diversify the city center of Guelph.

Having been inspired by the work of Postcommodity at the Guelph Café, Musagetes invited the collective to return to Guelph to discuss the possibility of further partnering with the collective on future works of art. The collective was invited to propose a new work of art with the challenge that the art be socially engaged, and that its outcomes would have some sort of capacity building outcome for the City of Guelph. Shortly after receiving the invitation from Musagetes to propose a new work, it was clear to Postcommodity that the work should extend *Game Remains*, and that the collective had the opportunity to leverage what it had learned by collaborating with Guelph citizens during the Café. What Postcommodity chose to do, was respond to the needs and desires articulated by the Citizens of Guelph who had participated in *Game Remains*. The consensus of these local collaborators was that there wasn't enough cultural diversity in the downtown area of Guelph, and that building a more desirable future for the city meant building diversity in the city.

Postcommodity decided that the next logical step was to transform into action the rhetoric of their *Game Remains* collaborators, other Guelph citizens, and Musagetes. As a result of this realization, Postcommodity proposed a new social engagement work of art titled "People of Good Will." The following is the collective's artist statement:

Heritage Hall (formerly Guelph British Methodist Episcopal Church) has stood at 83 Essex Street, Guelph Ontario, since 1880. The church was built by former fugitive slaves who arrived in the area via the Underground Railroad. Today the Guelph Black Heritage

Society preserves the historical significance of this important building by creating a cultural, historical and social centre within Guelph and Wellington County.

People of Good Will provides a new public venue in Downtown Guelph for culturally diverse peoples to share their voices, creative visions and experiences. Inspired by the Underground Railroad is a living history, Heritage Hall is a metaphor of cultural self-determination that can be shared with immigrant and culturally diverse peoples living in Guelph. Also, People of Good Will brings to light the historical involvement of Aboriginal peoples and others who assisted in the emancipation of former American slaves.

Resulting from *Game Remains*, rhetoric is moved into action by investing in a venue, a place of historical significance and symbol of diversity. To achieve this, Postcommodity has allocated portions of its budget from Musagetes to upgrade and rehabilitate Heritage Hall. While partnering with the site's stewards, the Guelph Black Heritage Society, Postcommodity extends historical narratives of emancipation to create a venue by which immigration and culturally diverse narratives can be shared with the Guelph public. In addition to this, as people of good will, all partners are investing both financially and through citizen labor to integrate the venue and its events into the vibrant Guelph city arts culture. This integration is not assimilation, but a broadening of participation designed to respond to the citizen consensus via *Game Remains* that was previously articulated during the Guelph Café. *People of Good Will* is a substantial investment by Postcommodity and its partners to achieve lasting socially transformative outcomes in Guelph. Postcommodity will culminate its participation with a final gesture of goodwill through a series of community games, using an improved version of *Game Remains*. By casting their presence in Guelph as guests and immigrants, the collective will contribute towards articulating the Underground Railroad as a living metaphor and history for the contemporary immigration experience.

Game Remains illustrates that the focus on educational technology does not only have to be didactic in nature. It demonstrates that learning goes beyond banking knowledge. *Game Remains* teaches us how to listen to each other, to co-intentionally collaborate, to share, to take turns, and to dialogue. There is nothing didactic about *Game Remains* that teaches these principles, however it is a tool and indigenous re-imagined ceremonial grounds by which Postcommodity and their collaborators use in order to encode protocols that guide dialogical interactions between a room full of diverse stakeholders, not to compete with each other over who can offer the best solution to civic problems, but instead how to listen to one another, and how to appreciate each other's rivaling ideas as a site for complexity and innovation. From a humanities and critical pedagogies perspective, learning isn't only about STEM and literacy, but it is also about public ethics and processes for using tools like STEM and literacy to transform the world according to the ways we imagine for ourselves (Freire). *Game Remains* demonstrates a place and process model for inquiry that maintains a focus on the self-determined needs and desires of communities, by providing frameworks for learning about diverse local values systems, and how to diplomatically apply these value systems towards consensus and action.

Resolana Electronica: An Indigenous Place and Process – 2013, by Martínez, C., Kemp, R., and Montiel, M.



Figure 16: *Resolana Electronica* gathering

Resolaneros/as in the *Resolana Electronica*. Photo by Cristóbal Martínez.

Resolana Electronica is a rhetorical digital media place and process for dialogues based on what is referred to by Northern New Mexican communities as a Resolana, which is an outdoor place along an adobe structure that receives direct sunlight. In New Mexican pueblos and villages, community members gather at Resolanas during the winter months for warmth and protection from the cold. When gathered together in these spaces, people of these communities often reflect upon local issues through dialogues. In this tradition, Resolana refers to the physical cultural space, community gathering, and processes of discourse. Resolanas foster and encourage meaningful experiences, and the emergence of community knowledge and awareness through reflection and sharing.

Towards the end of the 20th century, there was much theorizing among intellectuals and elders in Northern New Mexico about what a Resolana for the coming digital age might be (Montiel, Atencio, and Mares 30-42). *Resolana Electronica* is a response to these conversations, which is a digital media interactive environment that communities gather at and use to examine the particular implications about borderlands cultures when its peoples appropriate digital media for their own cultural production. Within *Resolana Electronica*, community members are challenged to learn, participate, and apply a theory of traditional Resolana to a culturally responsive practice of digital media. From this process, community dialogues become a site of trans-border knowledge creation and recovery.

A *Resolana Electronica* is a place and process by which people gather to have a dialogue with each other regarding a predetermined topic. In a *Resolana Electronica*, participants gather in a circle to deliver oratories that are augmented with shared images and sounds. During a gathering, orators make symbolic gestures with a Mexican Ayoyote Rattle—embedded with motion sensing and wireless technology—to interact with each other and with dynamic visual, textual, physical, and sonic media through full-body ceremonial gestures in ways that meaningfully contribute towards the sharing of oratories and stories. In this rhetorical place, oratory is augmented with the manipulation of digital media coupled to cultural protocols for verbal communication and reflective listening (Martínez 161-168). The gestures themselves are used to evoke specific traditional meanings tied to the 4Rs (respect, reciprocity, relationships, and responsibility), that are required for this re-imagined ceremony to be successful (Brayboy et al. 423-424).

More specifically, *Resolana Electronica* is a 15' x 15' full body interactive digital space. Community members gather in this space to engage each other in dialogues focused on a special topic through cultural practices that include particular ways of listening, speaking, turn taking, and gesturing. By following these processes, members of a group are able to use a symbolic, sensor embedded, tangible object (Mexican Ayoyote Rattle) to manipulate each other's digital media such as floor-projected images and sounds that augment dialogical narratives through indigenous re-imagined ceremony.

Prior to a gathering, the participants themselves create and upload the images and sounds that are shared during a *Resolana Electronica*. Throughout the gathering, the *Resolana Electronica* keeps track of how media is used in order to calculate an image map that provides resolaneras/os with feedback about their dialogue. Using a social computation algorithm, students are provided with information allowing them to reflect upon their collective use of media and its potential implications with regards to the course of their dialogue. Informed by this computational feedback, participants can identify knowledge gaps in their dialogues, and determine new directions for their discussions.

Resolana Electronica is an indigenous mixed-reality ceremonial space and process grounded in the art of dialogue. This interaction design applies a theory and practice of dialogue informed by southwestern indigenous concepts of dialogue. The design and implementations of *Resolana Electronica* were developed by members of indigenous communities within the Southwestern United States as an architectural place for indigenous re-imagined ceremony, and during its development has been critiqued by indigenous peoples from throughout North America.

Resolana Electronica is a place and process that supports new-literacies learning by leveraging the benefits of acquisition through embodied and social cognition. Likewise, it is a place and process that reflects state-of-the-art learning principles. In keeping with indigenous imperatives to promote diversity, conversations, and indigenous knowledge systems in education, *Resolana Electronica* demonstrates the potential of indigenous media to energize and revolutionize learning (Battiste 3-24).

Resolana Electronica has been used to accomplish social and cultural work in formal and informal learning settings. In formal learning it has supported high school and college course curriculums that include community dialogues in ethnic and cultural studies, as well as language-learning classes. In all these learning contexts, the *Resolana Electronica* was focused on student topics of concern such as immigration experiences, future aspirations, change, and violence in society. Through these efforts it provided students with a cultural practice for thinking critically about local community issues while learning digital literacy skills such as media creation and the use of digital media as a method for communication [= encoding + decoding + comprehension + production + consumption + distribution], it also provided these students with a forum by which they had the opportunity to practice local literacy and rhetorical skills in a local public setting. As an indigenous cultural expression of the digital age, the *Resolana Electronica* provides community elders with a tool to teach students to think critically about the use of digital media while illustrating the relevance of ancestral knowledge in relation to digital literacy and self-determination.

Worked Examples – Narrative: Recovering Knowledge, Histories, and Identities

Frontera! Revolt and Rebellion on the Rio Grande – 2013, Directed by John Leaños



Figure 17: *Frontera! Revolt and Rebellion on the Rio Grande*. Video still

Animated Short, 20 m – USA – 2014.

Artist Statement (Leaños J.J., Director): American Indian Film Festival.

The Pueblo Revolt had to happen. Life was out of balance. Drought, hunger, colonial violence, and religious persecution brought indigenous societies of New Mexico to the brink of collapse. The Pueblo people orchestrated the unthinkable – a pan-Indian uprising, successfully expelling the Spanish occupiers from the entire Rio Grande region, and leading to an Indigenous cultural and social renaissance. Frontera! Revolt and Rebellion on the Rio Grande traces the seminal events and colonial entradas that have shaped the deeply-contested territories of the U.S.-Mexico borderlands. Both Native and Chicana narrators recall this living history through humor, music, rap and cartoons.

Frontera: Revolt and Rebellion on the Rio Grande is a docu-animation film short created by a group of Chicana/o and Native American artists located in New Mexico and California. This film is one of a series of films by indigenous peoples documenting indigenous histories that take place along major rivers throughout the United States.

In this particular installment, *Frontera! Revolt and Rebellion on the Río Grande* tells the story of the Pueblo Revolt of 1680, which took place in the Upper Río Grande Valley of Northern New Mexico. During the Pueblo Revolt of 1680, Pueblo leader Po' Pay successfully led a campaign against the Spanish occupation of the Pueblos, and drove the Spanish out of the Upper Río Grande. This animation series is an example of indigenous storytelling using digital media, and represents indigenous efforts to broadcast histories that are not included within the history lessons that define school curriculums. In an effort to balance history and complicate the Manifest Destiny version of U.S. history taught in schools, this film series is broadcasted on PBS and will be screened at film festivals and free public events throughout the United States and abroad.

An example of the indigenous appropriation and repositioning of film can be found in the ways that indigenous values and perspectives are encoded into music and sound for the audio production of *Frontera! Revolt and Rebellion on the Río Grande*. In the film directed by John Leños entitled *Frontera! Revolt and Rebellion on the Río Grande*, mestizo artist and composer Cristóbal Martínez creates compositions reflective of the indigenous peoples of Northern New Mexico (the place where Martínez is from).

To salvage, hack and modify media, Martínez uses an indigenous methodological strategy for sound design and composition that grounds *Frontera! Revolt and Rebellion on the Río Grande*, where the film's narrative about the Pueblo Revolt of 1680 takes place. Local indigenous ways of knowing and doing in Northern New Mexico are built upon relationships to land and ecologies. To reflect these relationships, Martínez uses local indigenous knowledge to create the film's sound and music score as a way to

construct a sense of place within four sacred contexts of time: mythical time, historical time, the present, and the prophetic future.

To evoke the Upper Rio Grande within these four contexts, Martínez develops a score of local indigenous traditional instruments, makes use of traditional sonic tools such as animal calls, and applies local adaptive reuse practices of material culture as a framework for the design of musical electronic circuits made of recycled electronics. Together these instruments are composed, performed, and arranged into a contemporary soundtrack that embodies local Northern New Mexican values, helps to convey a sense of place within the film, and metaphorically projects the complex innovative and dynamic spirit of the people of Northern New Mexico.

In producing *Frontera!*, artists like Martínez, who are from Northern New Mexico, are able appropriate digital media for the production of a local indigenous story. This act of artistic and technological cultural and rhetorical sovereignty allows Burning Wagon Productions the opportunity to help mitigate erasures of indigenous histories within education, while building new literacies skills that extend oral traditions in ways that are co-determined with elders and communities. In a recent interview by Latino public broadcasting, the film's director, John Leños, is quoted as saying:

I hope people will walk away with an understanding of the history, colonization and resistance to colonization by the Pueblo peoples prior to the American colonial project. I also hope audiences are left wondering why they know more about ancient Greek culture from over 6000 miles away and over 2000 years ago, than they know about Native American culture and history that took/is taking place on the land beneath their feet. What is being hidden, ignored and excluded and why? I hope to plant the seeds for a decolonial understanding of our place and time, to instill wonder, passion and empathy for revolutionary acts of our ancestors. Ultimately, I think the Pueblo Revolt is an intriguing model for revolution, transformation and renaissance and hope that we might take note.

Imperial Silence – 2008, by Burning Wagon Productions

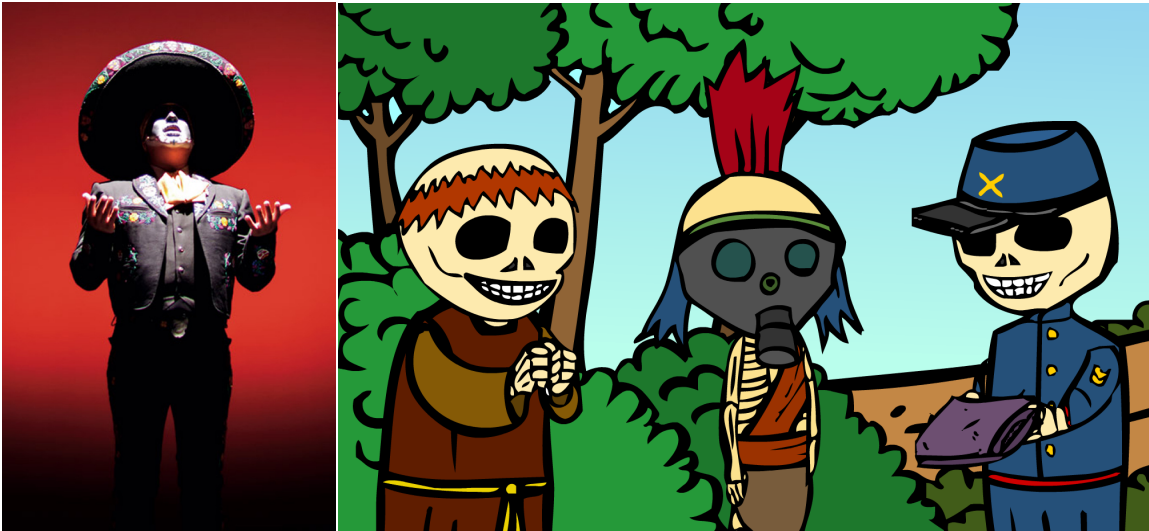


Figure 18: *Imperial Silence*, by Burning Wagon Productions. Performance and video still



Figure 19: *Imperial Silence*, female dancer, by Burning Wagon Productions. Performance still

Museum of Contemporary Art Chicago (MCA Chicago), *Photos by Gordon Huang.*
Dancers: Mayra Enriquez y Norberto Martínez.

Imperial Silence: Una Ópera Muerta / A Dead Opera in Four Acts is a multimedia opera composed for Mexican Mariachi, digital animation, and contemporary Mexican ballet folklorico. This work, directed by John Jota Leños, is produced by Burning Wagon Productions, a group comprised of Chicana/o and Native American artists. To produce *Imperial Silence*, artists appropriate commercial animation and video editing software to hack the western tradition of opera in order to proliferate the theater with an indigenous aesthetic of music, dance, storytelling, and performance. The purpose of re-imagining opera is to take advantage of the theater as a way by which to offer borderlands indigenous perspectives on current events to diverse publics.



Figure 20: *Imperial Silence*, by Burning Wagon Productions. Performance still MCA Chicago, Photo by Gordon Huang. Dancers: Mayra Enriquez y Norberto Martínez.

In addition to using the theater, the artists of *Imperial Silence* reach out to their own indigenous knowledge to re-imagine the traditions of *Días de los Muertos* as a vehicle to comment on issues such as the war on terror, and the border “problema.” In

Imperial Silence, Burning Wagon Productions offers critiques expressed through Chicana/o and Native American humor and by appropriating/adaptating Western stories whose meanings have been largely forgotten. It does this by populating stories such as Little Red Riding Hood with humorous indigenous characters that are acting out new indigenous narratives. By evoking indigenous humor, the artists of Burning Wagon are able to ease social and racial tensions as a way to create a sacred space where culturally diverse audiences can reflect upon subjugated histories, perspectives, and polarizing topics such as immigration and the war on terror.

Imperial Silence: Una Ópera Muerta / A Dead Opera in Four Acts is a bilingual new media opera that fuses animation with live Mariachi music and Mexican folkloric dance in a contemporary interpretation of the traditions of Dias de los Muertos. This performance of contemporary and traditional media practices explores cultural taboos around silence, war, and death with dark humored animation and mariachi flavored hip-hop, blues, rock and roll, and bossa nova music, as well as new border corridos.

Animator and librettist John Jota Leños directed *Imperial Silence*, which includes musical compositions by Cristóbal Martínez and the mariachi ensemble Los Cuatro Vientos, and choreography by Joel Valentín Martínez. The project is conceptually rooted in the ancient satirical tradition of the Days of the Dead, which portrays the dead laughing at and buffooning the constant hubris and folly of the living. In this context, the work critiques the United States' long history of silencing dissent and alternative perspectives during times of war as well as the tactical and discursive avoidance of dialogues about death, a history of silencing that Leños refers to as "Imperial Silence."

Worked Examples – Systems Critique: Weapons, Markets, Speed, and Simulations

If History Moves At the Speed of Its Weapons, Then the Shape of the Arrow Is Changing
– 2010, by Postcommodity



Figure 21: *If History Moves At the Speed of Its Weapons, Then the Shape of the Arrow Is Changing*, by Postcommodity. Installation view

3D sound sculpture (9 audio channels, loudspeakers, gold acrylic paint).

Image composite, installation view, Museum of Contemporary Native Arts, Santa Fe, NM, 2010. *Photo by Postcommodity.*

Artist Statement (Chacon, R., Martínez, C., Twist, K., Yazzie, S., Young, N.)

If History Moves At the Speed of its Weapons, Then the Shape of the Arrow Is Changing is a “sonic ambush” based on the physics modeling of Pueblo Revolt era weapons (bow and arrow, atlatl, sling and rock, and war club). The 3D sound sculpture sonifies an infinite number of ambush scenarios within the gallery. The result is a dynamic interactive audio-experience informed by the inherent physical and cultural properties of each weapon.

If History Moves At the Speed of Its Weapons, Then the Shape of the Arrow Is Changing, was installed at the Museum of Contemporary Native Arts, Santa Fe, New Mexico. It was part of an exhibition of works by the indigenous artist collective, Postcommodity, entitled *It Wasn't the Dream of Golden Cities*, which refers to the collective's theory of colonization. Within the context of Spanish colonialism,

Postcommodity's theory suggests that the Spanish were just as interested in controlling indigenous market systems as they were in finding gold.

The installation of this exhibition coincided with the 400th Anniversary of Santa Fe, and is a body of art that complicates the colonial narratives and histories communicated throughout the city's celebration. In this context, Postcommodity controls media through innovations that it uses to co-inscribe with the public, an indigenous led public counter-memory of Santa Fe, which, in the present, is a city that simulates a colonial past.

In this particular application of the media, Postcommodity demonstrates its literacies capacities (which includes digital media), within the context of Santa Fe's 400-year anniversary, to resist erasure of indigenous historical narratives; complicate narratives of representation often deployed in Santa Fe for the tourist gaze; diversify public memory; and remind the public about the violent implications of colonial capitalism historically tied to the City of Santa Fe. According to indigenous art theorist and curator Candice Hopkins:

Weapons reveal the cultural ideologies of their creators; they contain much information and meaning. The Revolt-era weapons, despite their seeming lack of technological sophistication, were highly deadly in the right hands. These weapons, combined with the general stealth of the resistors and their effective use of asymmetric warfare effectively staved off the Spanish with their guns, their tactical knowledge gained from conquering the huge cities of Mesoamerica, and their propensity for extreme acts of violence. When brought to life as part of the installation, they serve as one means of countering the historical amnesia that characterizes the Americas, an active forgetting of the blood that has been spilled generations ago on the very ground beneath our feet ("If History Moves at the Speed of its Weapons;" 123-124).

If History Moves At the Speed of Its Weapons, Then the Shape of the Arrow Is Changing is an audio/sound installation situated within a room painted gold. Installed within this gold room is an array of 9 audio monitors that project surround sound. These speakers produce sounds that are computationally generated by data sonification and sound synthesis algorithms. To achieve this work, Postcommodity wrote computer software to simulate the kinesthetic physics of four weapons used by the indigenous people of Northern New Mexico during the Pueblo Revolt of 1680.

This computational simulation is grounded to the Pueblo lands that the revolt took place upon. For example, the software is not just simply simulating decontextualized kinesthetic physics behaviors of the weapons, but instead simulates them within the environmental contexts that define the Upper Rio Grande Valley. Some of these generative factors include local humidity, altitudes, barometric pressure, temperature, and wind speeds.

In *If History Moves At the Speed of Its Weapons, Then the Shape of the Arrow Is Changing*, Postcommodity compiles ballistics data within an environmental context in order to create mathematically detailed models of the weapons used by the Pueblo Indians during the time of the revolt. By mapping various physics variables to the physical properties of four basic sonic waveforms—the sine wave, square wave, triangle wave, and sawtooth wave, Postcommodity creates a sonic simulation of the revolt. These sounds are panned around the room in accordance with trajectory data, creating the experience of various projectiles flying through space.

As visitors to the gallery experience an ambush of these weapons, they encounter the ghost and specter of war, or an invisible presence of war. This invisibility of war is the weapons that have been rendered “tactically invisible” by the increased speed of indigenous technology (129). This transformation of weapons systems is a critique of speed in relation to economic systems, politics, and warfare.

Through their installation, Postcommodity provokes dialogues that respond to theories of media by Paul Virilio, in his book titled *Speed and Politics*, which presuppose human adaptations to systems of increasing speed, change, and precision. *If History Moves At the Speed of Its Weapons, Then the Shape of the Arrow Is Changing* shows rival complexities such as the idea that while it is an installation largely driven by an extremely fast computational engine, the spirit of the media remains in context to the land in relation to weapons of slower velocity such as the bow and arrow, atlatl, sling and rock, and war club. Another reminder compounds this rival complexity that although we perceive these sonic weapons in accordance with the speed of sound, the artifacts of sound travel/pan across the gallery at the same velocity as the traditional weapons. In this case Postcommodity hacks digital media to bend its inherent velocities in accordance with indigenous values, while also demonstrating and critiquing increasing velocities that are empowered by advancing high-speed technologies.

Postcommodity’s theory and logic is that values can be recovered through an analysis of tools as well as encoded into tools. Both processes occur as the artist collective transcribes the spirit and use of indigenous weapons into sounds reminding us

that the invisibility of weapons is proportional to their speed. Indigenous art theorist and curator Candice Hopkins quotes Postcommodity artist Kade Twist as stating:

“[the installation] is also influenced by the writing of Paul Virilio (*Speed and Politics*). He came up with the idea that history and the rationalization of temporary relationships within a particular society/civilization moves at the speed of its weapons—we culturally rationalize velocity through our weapons systems—in this context we are looking at the velocity, or dromological difference of the two clashing civilizations and analyzing the indigenous cultural identity and worldviews embedded in the weapons systems. (Hopkins, “If History Moves at the Speed of its Weapons” 122)”

A More Just, Verdant and Harmonious Resolution – 2011, by Postcommodity



Figure 22: *A More Just, Verdant and Harmonious Resolution*, by Postcommodity. Installation view

Interactive five channel video and sound installation. Installation view, Contour: 5th Biennial of Moving Image, Mechelen, BE. SouthwestNet: Postcommodity, *Pollination*, Scottsdale Museum of Contemporary Art, Scottsdale, AZ, 2015. *Photo by Julie Ganas.*

Artist Statement by Postcommodity (Chacon, R., Martínez, C., Twist, K., Young, N.)

Promoting a More Just, Verdant and Harmonious Resolution *has the initial appearance of an immersive four channel video installation. On each wall of the gallery space are floor-to-ceiling video projections seemingly captured from the Western imagination, dreamed of and remembered. They are moving pastoral images of an idealized, though strangely intangible world inspired by the video displayed during the mass assisted suicide depicted in the 1973 science fiction film Soylent Green. While engaging the seemingly meditative video installation and walking about the gallery space, audience members will inevitably step on one of eight detonation triggers embedded in the floor, setting off a concussive sonic explosion shaped by a generative physics model of real-world IED explosions — particularly IEDs that utilize found consumer objects and electronics. The audience-triggered explosions are comprised of fragments of sampled music ranging the iconic pop of Burt Bacharach, Beach Boys and Beatles to the heavy metal of Slayer, Metallica and Black Sabbath and punk rock of the Ramones, Bad Brains*

and Stiff Little Fingers. In all, hundreds of samples are randomly utilized as sonic shrapnel. The result is an exaggerated moment in which audiences are enveloped by the physical properties of an Afghanistan hot spot and simultaneously assaulted by the sonic artifacts of Western colonialism in which members of the audience share the sudden and disorientating experience of having their collective musical memories envelop them and flash before their eyes. The sound is powered by a network of bass subwoofers and transducers mounted below the gallery floor that provide the audience with a jarring physical and sonic experience that is further enhanced by a fully directionalized 3D sound system of flat response monitors mounted to the gallery walls. As the sonic explosion is triggered by audiences, the projected videos are momentarily reduced to feedback. The result is an exaggerated moment in which audiences are enveloped by the physical properties of an Afghanistan hot spot and simultaneously assaulted by the sonic artifacts of Western colonialism in which members of the audience share the sudden and disorientating experience of having their collective musical memories envelop them and flash before their eyes. Postcommodity uses improvised explosive devices (IEDs) as a metaphor for exploring the relationships and tensions between political sovereignty, global stability and cultural and ethnic-specific self-determination movements; the DIY ethos of punk, metal and other forms of popular music, and the DIY ethos of insurgent tactics; the role of popular music as an agent of democratization, and the role of IEDs as means of achieving political legitimacy; and, the historic role of popular music within the legacy of military psychological operations (PSYOP).

To inspire dialogues, Postcommodity uses experiential media to illustrate the irrational speculative market systems that often serve as the catalyst for war. The collective accomplishes this task by illustrating the irrational complexity of semiotic systems and their vexing deployment within the context of deadly high-speed violence. By creating a work of confusion as a metaphor for war, Postcommodity, examines the role of Western popular music in relation to Middle Eastern IED explosive devices—both of which originated from DIY (“Do-It-Yourself”) origins and are used to discipline market systems.

Pollination – 2015, by Postcommodity



Figure 23: *Pollination*, peepshow booth and view, by Postcommodity. Installation view

Mixed-media installation. *Pollination*, Scottsdale Museum of Contemporary Art, Scottsdale, AZ, 2015. Photos by Julie Ganas.

Curatorial Statement, Scottsdale Museum of Contemporary Art (S. Cochran)

Pollination evokes the premises of a peepshow currently doing business in New Mexico. However, it contains a garden that serves as a surrogate for coveted female flesh. On one level, this vexing switch is not so outlandish. The female body and nature have long been conjoined by literary and artistic allegories. They have both been fetishized as powerless objects of desire. Given the reality and politics of water in the Southwest, it is possible to imagine a dystopic future in which lush natural landscapes could provoke the same illicit response as salacious spectacles. Fantasy is predicated on the unattainable.

*Playing with frustration and desire, the peepshow is a pay-to-play ritual and stands here as an anxious metaphor for speculative capitalism with its rewards, liabilities and consequences. The piece pits a dominant male gaze against the disenfranchisement inside the window. *Pollination* critiques global market systems that thrive on colonial models of the exploitation of resources and peoples as well as overt forms of violence, objectification and sexual subordination. The piece continues Postcommodity's interrogation of the dominance of the Western scientific, historical and economic models by questioning the acceptance of corporate and consumer activities that endanger our environment, society and the larger world.*

*Like much of Postcommodity's previous work, *Pollination* emphasizes audience participation and interactivity within an immersive environment. Undermining the anonymity and neutrality traditionally enjoyed by museum audiences, this work deliberately subverts expectations and power dynamics between viewer, institution and artists and probes the limits of the definition of the museum as a of reflection and contemplation.*

Worked Examples – Diplomacy: Across Time-Space to Form Alternative Publics

Do You Remember When? – 2012, by Postcommodity



Figure 24: *Do You Remember When?* by Postcommodity. Installation view

Site-specific intervention and mixed media installation (cut concrete, exposed earth, light, sound). Installation view, Art Gallery of New South Wales. 18th Biennale of Sydney, Sydney, AUS, 2012. *Photo by Postcommodity.*

Artist Statement (Chacon, R., Martínez, C., Twist, K., Yazzie, S., Young, N.)

The hole and exposed earth of Do You Remember When? becomes a spiritual, cultural and physical portal – a point of transformation between worlds – from which emerges an Indigenous worldview engaging a discourse on sustainability. The block of concrete on the pedestal – the foundation of the institution constructed on top of aboriginal lands – functions as a trophy celebrating Indigenous intervention in opposition to a Western scientific worldview. The closed-circuit generative audio broadcast of songs and animal calls performed by members of local communities that are part of the aboriginal peoples of Sydney provides the psychosocial soundtrack of the transformation process. The work shifts the sustainability from a focus dominated by Western science to a balanced approach inclusive of Indigenous knowledge systems.

Do You Remember When? was installed at the Art Gallery of New South Wales (AGNSW) during the 18th Biennale of Sydney. Distinguished by its emblematic Greco-Roman façade, the AGNSW is a symbol of imperialism, a crowning monument to Australia, and an institution implicated in the assimilation/erasure of aboriginal peoples. The installation features a large hole cut into the gallery floor, prompting the question: What exigency could possibly justify collateral damage to the guarded polished floor of the AGNSW? The answer: Australia's national apology to aboriginal peoples.

As indigenous convolution media, *Do You Remember When?* is a multi-modal immersive interactive environment designed to mediate the re-construction of public memory. This installation is a 4' x 4' piece of polished aggregate concrete cut from the gallery floor and mounted atop a plinth, thus exposing the earth beneath the slab. Created through a co-intentional process grounded in dialogue with community partners, this intervention creates a portal by which the citizens of Australia and visitors from other nations can look into the past to remember a time before urbanization.

By uncovering earth beneath the gallery, the exhibit repatriates place. Additionally, an aboriginal cultural implement misappropriated by the colonizer for the tourist gaze is also uncovered through a traditional public presentation of the instrument. People throughout the world recognize the didgeridoo as a musical instrument used to make world-beat music, however a traditional use of didgeridoo is to produce animal calls. To repatriate these sacred calls, Postcommodity collaborated with aboriginal didgeridoo players of Sydney to produce recordings of traditional didgeridoo and songs. The recorded audio is transmitted to a sound system buried beneath the installation's

exposed earth, thus creating an aboriginal ground from which the calls emerge. Rising through a portal, the voices of animals and songs infuse the colonizing institution with an indigenous worldview. A system of acoustics makes the installation interactive as a microphone hanging above the hole detects the animal calls. Postcommodity wrote software to process the microphone signal by parsing it into four discrete-delayed tracks; and by hacking the videogame *Pong*, the collective created audio textures of animal calls that generatively evolve while acoustically traveling and ricocheting off gallery walls. Visually imperceptible, this sonic movement travels and wanders throughout the gallery. The effect creates the experience of animals panning around bodies in the space. In addition to the moving sounds, the installation beckons participants with a steady local sound source—the hole. During the exhibition, many visitors put their heads at the base of hole to listen more closely to the earth. Having been drawn to the hole, people often moved about the space to experience the immersive sound. The sounds of their footsteps were also detected and mixed into the moving sound. In addition to these sounds, visitors listened to the slab, which generated a bass feedback drone resulting from a contact microphone and connected amplifier tuned to the natural frequency of the slab itself.

In designing *Do You Remember When?* Postcommodity worked co-intentionally with partners, including Biennale curators, to co-construct an experience architecture—from visual to sound—built upon a cross-cultural dialogue between peoples, between symbolic artifacts, and between the installation’s materiality and the visitors’ engagement with the space. The embodied experiences spurred tears, as well as reconciliation, within a discourse of co-intentional/cross-cultural sustainability.

With Salvage and Knife Tongue – 2012, by Postcommodity



Figure 25: *With Salvage and Knife Tongue*, by Postcommodity. Installation view

Generative four channel video and sound installation. Duration: Infinite. Installation view, Adelaide International 2012: Restless. *Photo by Postcommodity.*

Artist Statement (Chacon, R., Martínez, C., Twist, K., Young, N.)

With Salvage and Knife Tongue examines how Indigenous people in the United States and Australia have appropriated the English language as a means of rationalizing and representing their respective cultural and political identities. To achieve this, the piece evaluates Cherokee and Pitjantjatjara uses of English through features like annunciation, intonation, and accentuation. This process produces a generative synthesis of varying Indigenous experiences of colonization geographically -- as Northern and Southern Hemispheres, American and Australian; and sonically as individuals representing unique cultures, and ethnicities. The immersive installation environment features a semi-circle of four large suspended video projection screens that showcase generative combinations of American and Australian Indigenous people articulating lines of a poem with varying combinations of actors, stanzas, and simultaneity. Their speech is analyzed in real time, applying analysis and re-synthesis of sound using audio convolution and morphing algorithms. This synthesis technique allows the characteristics of speaker's voices to influence each other, yielding the similarities and differences between their vocal expressions that result in the creation of new voices of shared experience.

Postcommodity's work, *With Salvage and Knife Tongue*, is a linguistic phonemic examination of how indigenous groups in the United States and Australia have appropriated colonial English as a means of rationalizing and representing their respective cultural and political identities within the contexts of colonization, imperialism, neo-liberalism, globalization, and nation-states. To achieve this, the piece simultaneously synthesizes and contrasts Cherokee and Pitjantjatjara uses of English by visually and sonically underscoring the linguistic phonetic features forming their English language accents. This phonemic inquiry contributes to a work of art that both linguistically underscores intercultural differences while also making concrete a unifying connection between the Cherokee and Pitjantjatjara – two indigenous groups separated by the Pacific, yet who have both survived British colonization and removal from their ancestral homelands. Today these groups continue to endure the exterior forces of the neo-liberal global market with a strong resolve for self-determination.

In their effort to provoke the systematic complexity of intercultural ceremony, Postcommodity created a generative and immersive computational video installation environment complete with spatially projected audio. *With Salvage and Knife Tongue* is a generative synthesis of varying Indigenous experiences of colonization geographically – as Northern and Southern Hemispheres, American and Australian; and sonically as individuals representing unique cultures, and ethnicities. The immersive installation environment features a semi-circle of four large video projection screens showcasing computationally generative combinations of four American and/or Australian indigenous people articulating lines of an indigenous empathetic poem – about the displacement of

people (which is about getting kicked out of or forcibly removed from your home) resulting from the early 21st century global economic meltdown. These four projections feature varying combinations of actors and lines of poetry emerging into endless patterns of symmetry and asymmetry. All possible combinations of variables, which include gender, age group, ethnicity, and poetic line, are generated using a probability model that changes over time. This temporal nature of Postcommodity's generative model allows the collective to approximate the work's aesthetic structure as it randomly unfolds over time.

Postcommodity's generative algorithm created for *With Salvage and Knife Tongue* leads to various line-by-line outcomes that, for example, project a scenario where all of the people featured at a given moment may all articulate the same line of the poem, while at other times differing combinations of poetic lines emerge revealing other results. With all possible variables considered, *With Salvage and Knife Tongue* will produce hundreds of outcomes. Mixing the variables mentioned in the previous paragraph leads to patterns such as two young women articulating the same line while two elder women articulate a different line all in simultaneity. To add a final level of complexity, the following is an example that includes the variable of ethnicity as part of the composition. One of these outcomes includes a scenario where two elder Cherokee men and two younger Pitjantjatjara men each individually and simultaneously articulate a differing line, thus resulting in a cacophony of speech, whereas at other times one might witness a younger Cherokee woman, a younger Pitjantjatjara Man, an elder Cherokee man, and an elder Pitjantjatjara woman all articulating a chorus of the same line all at once. There may be times when in simultaneity a Pitjantjatjara elder and youth (perhaps differing genders

or the same gender) together recite one line, while a Cherokee elder and youth (perhaps differing genders or the same gender) together recite a different line. Another example includes a scenario where differing lines map to Cherokee and Pitjantjatjara elders in contrast to Cherokee and Pitjantjatjara youth. Through Postcommodity's generative computational algorithms, these and all possible patterns eventually emerge over time.

As choirs of poetic lines are visually and sonically displayed, speech is analyzed in real time by applying synthesis and re-synthesis techniques of sound using audio convolution and morphing algorithms. These audio techniques allow the characteristics of speakers' voices to influence each other, yielding the similarities and differences between their vocal expressions, often resulting in the creation of new voices of shared experience. These new synthesized voices are projected from the rear of the gallery at the same time that the unaffected voices emanate from the respective video screens that given individuals are projected on at a given moment, so if person B is projected on screen one, then a visitor will hear person B's voice emanating from screen one.

Postcommodity's intentions for mediating this intercultural, multi-linguistic, and intergenerational complexity across gender are driven by its noise ethos, characterized by a likelihood to problematize cultural models about humanity often oversimplified by mass media while made concrete by the status quo. *With Salvage and Knife Tongue* demonstrates the indigenous adaptive reuse of the English language as a means of survival and resistance in the face of subjugating and historically violent forces. It is an idea that provided the opportunity for dialogue between indigenous groups that could only take place between two groups in co-located ceremonial space.

Repellent Fence – 2015, by Postcommodity

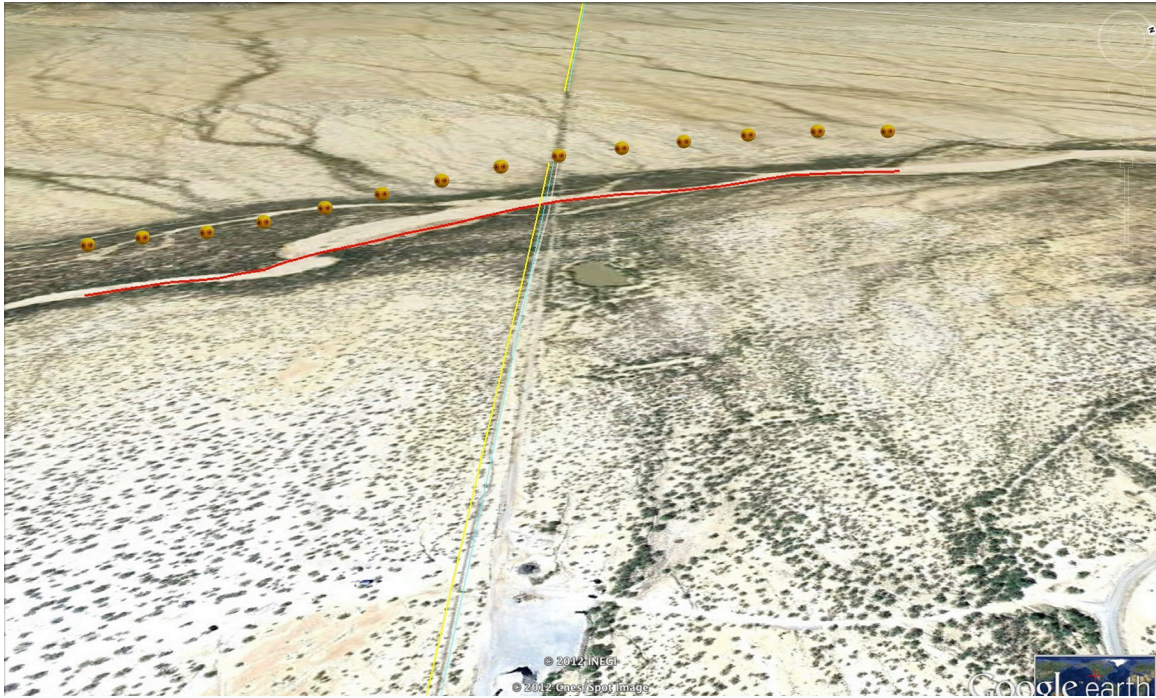


Figure 26: *Repellent Fence*, by Postcommodity. Photo mockup



Figure 27: *Repellent Fence* installation mockup, by Postcommodity. Installation view

Site-specific installation and social engagement. Two mile long ephemeral sculpture.
U.S./Mexican Border. *Photos by Postcommodity, 2015.*
Artist Statement (Chacon, R., Martínez, C., Twist, K., Young, N.)

The Repellent Fence is a social collaborative project among individuals, communities, institutional organizations, publics, and sovereigns that culminate with the establishment of a large-scale temporary monument located near Douglas, Arizona and Agua Prieta, Sonora. The purpose of this monument is to bi-directionally reach across the U.S./Mexican border as a suture that stitches the peoples of the Americas together—symbolically demonstrating the interconnectedness of the Western Hemisphere by recognizing the land, indigenous peoples, history, relationships, movement and communication.

The creation of this monument will correspond with a series of public events resulting from collaborative and local community engagement processes. Critiquing the oversimplified border rhetoric of mass media and bi-partisan politics, Repellent Fence and its corresponding events include the participation of borderlands stakeholders, across diversity and interests, in generative conversations -- as a means of broadcasting complex approximations about the complexity of movement (peoples, cultures, ideologies and capital) of U.S./Mexico transborder systems. In other words, the intention of Repellent Fence is to organize a network of dialogues between indigenous, United States, and Mexican publics and their government agencies. The intentions for these generative dialogues are to form local and external capacities for the recovery of transborder knowledges that have been arrested through binary discourses. The benefit of these narratives are to identify and support indigenous and border community interests, desires, concerns, and goals for creating a more safe, healthy, and culturally appropriate borderlands environment for its citizens.

In addition to broader stakeholder implications, the intention of the Repellent Fence is to dialogue with the complex realities of the border experiences of indigenous peoples, which includes those who are geographically divided by the United States/Mexico border by examining the regional to global implications of political agendas and economic policies between neighboring sovereigns (the United States and Mexico). The goal is to shift transborder discourses away from dehumanizing and polarizing constructs of nationalism and globalization, and to reposition discourses into a dialogue that is respectful of the indigeneity upon which borders and trade policies have been fabricated. The goal is to use the borderlands as a metaphor to acknowledge and honor the Indigenous peoples of the Western Hemisphere – both those who are experiencing diaspora, and those who are coping with the militarization of their ancestral homelands. Repellent Fence recognizes all indigenous peoples that are intermeshed in the theater of the contemporary immigration crisis of the Americas – here we (Postcommodity) refer to the historical stewards of the land, and those who are following ancient indigenous trade routes in search of economic opportunity.

Repellent Fence consists of 28 large-scale helium balloons that will be installed at 100 feet intervals, to create a porous linear structure intersecting the U.S./Mexican border and stretching across the landscape for 1 mile on each side of the border fence. The balloons themselves are indigenous spiritual mediators imprinted with indigenous medicine colors of indigenous tribes both north and south of the border, as well as a graphic of concentric circles whose uses span across indigenous cultures throughout the Western Hemisphere. The expansive uses of this graphic by indigenous populations are a reminder of pre-Colombian indigenous economies and the movements of peoples facilitated by these economic systems.

These concentric circles are also coincidentally used as a “scare eye” on smaller beach ball sized balloons that are marketed as bird repellent products. For example, these balloons are used to repel pigeons from a car driveway, thus preventing the pigeons from defecating on cars parked on the driveway, or the driveway itself. However, these products are embedded with planned obsolescence, meaning that birds eventually acclimate to these balloons by realizing that they pose no threat. Upon acclimating, not only do the birds resume their habit of defecating on the places the balloon was meant to protect, they may also defecate on the balloon itself.

In Repellent Fence the enlarged and appropriated balloons double as indigenous spiritual mediators, as well as metaphors for the contemporary global market systems mediated by the U.S./Mexican border.

Worked Examples – Building Critical Media and Digital Literacies Capacities

E2textiles: Ethno Electronic Textile Designs for Broadening Participation in Computing for American Indian Youth, Teachers, and Communities



Figure 28: Electronic textile by a Native American middle school student

Excerpts from a final report compiled for the National Science Foundation Computing Education for the 21st Century (CE 21), Grant (#1150150). *Kafai, Y., Brayboy, B., Searle, K., and Martínez, C. (2014). Photos by Cristóbal Martínez.*

Ethno E-textiles (hereafter, e2textiles) introduced American Indian youth, teachers, and community members to computing by taking a culturally responsive approach to designing electronic textiles (textiles infused with electronic technologies).

The goals of our project included:

- To examine how to best teach computing with electronic textiles in culturally responsive ways through design-based research
- To pilot models for culturally responsive computing with American Indian youth and their teachers.

Our research on e2textiles took place at a local Arizona Indian community located near Phoenix, Arizona. During the grant period, we were able to introduce over 100 students to computing using electronic textiles. In addition to this significant contribution

to the community, we were able to participate in school and community dialogues and use American Indian education research to develop curriculums that introduced students to computing in a culturally responsive manner.

By culturally responsive open design, we mean activities with e-textiles in which students determine designs. Rather than focusing on a particular cultural construct, students are given the opportunity to determine their own designs or make choices when provided a set of designs. Over the course of the grant, our activities included offering e2textiles units in Native Arts and Native Studies classes, running e2textiles activities in partnership with a local community college summer program for youth, and several other outreach activities.

[1] Native Arts: Pilot Project, Culturally Responsive Open Design

From March – May 2013, we worked with 12 seventh and eighth grade students (9 females, 3 males) to make e-textiles in the context of a Native Arts class. This was our first attempt at integrating Indigenous Knowledge Systems and computing. Working with the classroom teacher we made a conscious decision to give students very few design constraints, since this was how the classroom teacher had approached all of the other projects students engaged in throughout the year.

Students were told that they had to design and program an e-textile project with at least two LEDs (light emitting diodes) and a LilyPad Arduino microcontroller. We showed example projects made by us and by students in previous workshops, but we did not give students any design constraints in terms of what they could or could not make. As a result, students mainly created felt patches with e-textile elements that could later be

affixed to their hoodies or backpacks. Their designs mostly reflected interests in teenage popular culture rather than Native culture or local traditional aesthetics.

[2] Native Studies: Intermediate Level Culturally Responsive Design With Constraints

During the 2013 - 2014 school year, we conducted a three-week e2textiles unit as the culminating project in four separate sections of Native Studies for Jr. high students at Arizona Indian Community High School. In total, we worked with 76 seventh and eighth grade students (47 females, 29 males) over four quarters. As part of a school-wide decision to gender segregate elective classes, Native Studies was segregated by grade and gender. Working with the Native Studies teacher and his aide, we designed each quarter around a culturally relevant theme connected to other course material.

Themes included elements, plants, animals, and traditional foods. Each student chose a design related to their class theme and then created a “chain reaction” sweatshirt using LEDs, conductive thread, conductive fabric, and felt. Student designs were connected to hooded sweatshirts in such a way that, when the projects are joined together in a circle and the wearers are holding hands, all of the project designs light up. These projects provided an embodied experience tied to a community value that include the importance of respectful relationships between people, and to values taught in Native Studies, which were grounded in relationships between people and the natural world.

Furthermore we also sought to provoke students to consider their relationships to electronic technology and how these relationships may be informed by local knowledge and technology practices. As a spin-off of the Native Studies class, we began hosting workshops during lunch for students who were unable to complete their projects in the

allotted class time. These workshops provided an informal learning space for students to delve deeper into computing.

[3] Jr. ACE Summer Program: Integrated Culturally Responsive Open Design

In addition to formal classroom settings, we conducted e2textiles workshops as a part of summer programs for middle school students at a local community college, which took place during the summers of 2013 and 2014. The programs provide a pre-college experience for fifth through eighth grade students and combine academic content with explicit instruction about local indigenous cultural practices.

In designing these projects we worked closely with the community's Cultural Resources Department to integrate e2textiles with local cultural knowledge. During the 2013 program we worked with 27 youth (9 male, 18 female) to make light-up versions of local plants, which were then situated on a quilt in the shape of tribal lands, displayed for friends and family, and featured in the community newspaper. During the 2014 program we worked with fourteen seventh and eighth graders (8 girls, 6 boys), a science teacher from the Arizona Indian Community High School, and a teacher's aide to make light up badges focused on identity and community values.

Students were charged with creating their own symbols to reflect something important in their lives and asked to integrate a LilyPad Arduino and at least three LEDs into the design. Projects ranged from a light up Eiffel Tower made by a student who valued travel and dreamed of visiting Paris to a fire-breathing "Godzilla Junior" made by a student with a sense of humor and a love of science fiction. For many students, this was

their second, third, or fourth e-textiles project and so student designs were much more sophisticated in terms of the crafting, circuitry, and coding.

Several students incorporated sound buzzers and spent significant amounts of time coding their projects to play songs they composed. While these projects may not seem immediately culturally responsive, they connected to students' interests and opened up spaces for larger conversations about cultural symbols and their appropriation by outsiders, for instance. Although the content did not appear to reflect local indigenous concepts, the students underlying project choices, such as a basketball design, were chosen by students to think about indigenous values that were supported through presentations and a panel by community members. Community values were taught around themes such as: respect, relationships, helping each other and caring for each other, local history, stories, and the importance of place.

[4] Student Outreach: Introducing 5th and 6th Graders to Electronic Textiles

In addition to the summer camps, we also conducted outreach activities to 36 fifth (13 male, 23 female) and 27 sixth graders (5 male, 22 female), making simple circuit light up badges with the fifth graders and simple circuit e-textile bracelets with the sixth graders. During these outreach activities, we had the opportunity to teach students some of the basic principles of electricity, as well as provoke them to think about the role of electricity in their daily lives, and the role of electronic technology in their culture today and in the future.

E2Textiles: General Findings

In terms of intellectual merit, we found that design activities with e-textiles needed to be constrained in terms of both technical components (e.g., “You must use a LilyPad Arduino and four LEDs”) and cultural area of focus (e.g., Native plants, the elements). A second key finding was that pedagogical strategies such as collaborative group work and pair programming allowed us to provide culturally responsive instruction even when students’ e-textiles projects were not explicitly culturally connected. A third key finding was that culturally responsive computing activities were most successful when they were connected to out-of-school activities like a field trip to visit the tribal museum. These activities allowed students to see that the issues they were grappling with in the classroom were issues that engaged the entire community.

In addition to more closely connecting e-textiles to local cultural knowledge about the environment, situating the making and programming of e-textiles in a Native Studies class allowed us space to have critical conversations with students about what Indigenous technology looks like and whether their projects fit the Indigenous technology criteria they developed as a class. An important finding was that many students struggled to see themselves as producers and owners of the kinds of technology associated with computer science and electronic technology. Students also had a difficult time connecting electronic technology practices to notions of local indigenous traditions, therefore in some cases did not see how electronic technology could be appropriated and re-imagined as a local indigenous practice.

Key Outcomes and Achievements

Throughout the two-year period of our planning grant, we conducted design-based research to pilot and refine successful workshop models for teaching computing to American Indian youth, teachers, and community members using electronic textiles. Through the process we recognized that while not all youth were engaged by culturally-responsive computing, e-textiles activities provided several points of connection to students' lives, of which learning about their cultural heritage was one important component.

Several significant findings have emerged from our work. While we struggled to create strong linkages between e2textile workshop activities and community language and heritage cultural practices (e.g. basket weaving), we found that many students came from homes where various forms of crafting (e.g. sewing of clothing, beading, quilting) and/or electronics (e.g. wiring a trailer to a truck and making sure its lights worked) took place. These activities provided an important point of connection that a computing activity that took place solely "on screen" would not have provided. Students' parents were also able to demonstrate expertise and generate conversations related to e-textiles in ways they could not do with other school-based artifacts, such as a math test or an English paper.

As such, e-textiles provided an important point of home-school connection and fostered conversations about computing that moved across the spaces of home and school. We also found that while students took ownership of the making and programming of their e-textiles artifacts in class, they often presented a view of

computing as outside the realm of Indigenous technologies. Acknowledging the challenges associated with building culturally responsive curriculums that provide more effective pathways allowing students to consider the possibilities for indigenous self-determination through exercises of digital media in relation to identities and traditions, in terms of broadening participation to American Indian Youth, we found that e-textiles, when supported by culturally responsive instruction, offered a promising activity that connects with students' prior crafting experiences and for cultural studies.

CHAPTER 6

COMPILING PROGRAMS INTO /*NATIVE*/ CODE ()

The Digital Divides Us

Challenges and Recommendations Concerning the Development of Local Information Technologies Infrastructure and Indigenous Digital Media Literacies Capacities

For several decades, media theorists and the creators of the Internet predicted that the World Wide Web would bring the people together into what McLuhan referred to as a “global village.” McLuhan as well as indigenous scholars like Vine Deloria Jr. predicted that the Internet would have a “tribalizing” effect because individual privacy would vanish, and the privacy of people’s individual lives would become public (McLuhan and Fiore 63, 66-67; Deloria Jr., “We Talk” 19-32). In many ways, these predictions have now come to fruition because today surveillance appears totalizing in its power.

In addition to surveillance, there is another issue of concern for humanity that is associated to predictions of a global village. This issue is the theory that the Internet is a globalizing force, and that it has the power to homogenize people’s ways of being, thus having the potential to create a monoculture (McLuhan and Fiore; Adorno and Horkheimer). Any assault on diversity is clearly imperial and colonial in nature. However, I argue that human relationships with varying physical geographies will continue to work against the power of electronic networks to homogenize humanity. Maintaining cultural diversity is hard work, though, and I argue that it is up to us, not only to preserve our diverse human heritage, but also to learn to value one another’s gifts of difference (Deloria Jr., “We Talk” 19-32).

Complicating manifestations of colonization such as corporate and government surveillance and cultural homogeneity (via a culture industry) are other theories such as that today's bi-directional communication media makes it possible for all people to receive, produce, and massively distribute media. This circuit for communication also makes media malleable for group sovereignty, collective consciousness, the formation of learning communities, and the open sharing of knowledge. The Internet now opens up endless possibilities for human communication and learning of any group and individual. It also makes it possible for everyone with access to infrastructure and technology literacies skills to use power systems, such as knowledge networks, as producers and consumers of knowledge, and to approach the global market as both consumers and entrepreneurs (U.S. Congress, Office of Technology Assessment 3-5, 10; Margolin 1).

Although aspects of the "global village," like paramilitary surveillance, have come to fruition, the prediction of unity implied by the promise of a global village has not. This is because the digital divides us, just like other economic systems, which I have critiqued throughout this research. The digital divide is the difference between those with access to communications technologies, like the Internet, and those who lack access. It is also much more than this simple binary.

However, through the lens of this binary alone, we can see that, without access to digital media, a people cannot access power systems. Without access, a people are denied their human right to communicate, as well as to contribute toward and influence systems of power. Many who do not have access are already subjected to and (or) subordinated by

the systems they are silenced from (U.S. Congress, Office of Technology Assessment 6, 95-96). In essence, the digital divide is the denial of Tecno-Sovereignty (2).

Earlier in this research, the digital divide is framed as an infrastructure issue, referring to those who have access to technological infrastructure and those who do not. I also provide a more nuanced understanding by articulating that the digital divides us according to who has access to the fastest technology versus those who only have limited access to slower technologies. To provide an example, this is the difference between someone who uses a home Ethernet connection in the United States and someone in a developing nation who has to go to an Internet café to use a computer connected to a dialup modem.

Using a dialup modem Internet connection is like bringing an old jalopy to a formula one race. There's no disputing the winners and losers in this race, even before the race begins. The difference is that there are more serious consequences to digital inequities than a car race. For example, some websites offering critical financial or medical services aren't accessible with a slow connection. Videos and other multi-media messages are also difficult to access. Everyone who has used the Internet understands the frustrations associated to a webpage loading at a snail's pace, or failing to load at all, because of a slow connection.

The digital divides us by speed and in accordance with those who do and do not have access. In fact, the LA Times recently featured a study released by the United Nations reporting that 60% of the world's population did not have access to the Internet as of the end of 2014 (Rodriguez). Furthermore, the U.N. has reported that 78% of people

from developed nations have access to the Internet, in contrast to only 32% of the population residing in developing nations (“ITU Releases 2014 ICT Figures”).

When we think about the 78% in developed nations like the United States, we can still see areas where the divide exists. For example, when we consider the FCC Native Nations and Consultation Policy Report and recent blog posting by the National Communications and Information Administration, United States Department of Commerce (“Narrowing the Digital Divide”), we see that there continues to be a large lack of broadband Internet on Native American reservations. Although the National Broadband Plan, the Native Nations and Consultation Policy Report, and the Congressional “Telecommunications Technology and Native Americans: Opportunities and Challenges” were all written in 2012 to address communications disparities in the United States, the digital divide remains a critical issue in Indian country.

Ongoing digital disparities are evidenced by the lack of progress reports by the U.S. federal government, federal government reports, and by recent reports of the ongoing digital divide in Indian Country from Native American news sources and mainstream media. In a recent 2014 article by CNN Money titled “We Native Americans are ‘poster children’ for no Internet access,” the establishment of broadband across 566 federally recognized tribes is at a whopping 10% (Gayles)! This is despite the fact that Native American nations have been actively pursuing, through negotiations with the federal government and corporations, high-speed Internet in their communities (Bissell; Gordon, Gordon, and Dorr; Margolin; Twist). Today the digital divide remains an indigenous issue for communities around the world.

Although there is the possibility for indigenous peoples to open up new areas of indigenous sovereignty, Tecno-Sovereignty cannot be operationalized without access to technology infrastructure, and requires that indigenous peoples decide for themselves how to best manage technology (U.S. Congress, Office of Technology Assessment 17, Margolin 8-9). Tecno-Sovereignty includes opportunities for language revitalization, language preservation, cultural emergence, rhetorics of public engagement, entrepreneurship, health and wellness, technology innovation, and for creating new nation building governing capacities.

According to scholars, policy makers, and the media, broadband companies in the United States are not interested in providing Native American communities with broadband because they represent an economy that is too small for corporate profits (Margolin 4, 10-11; Bissell 129; Gayles; Twist). In addition to these issues, reports point out that the complicated trust doctrine relationship that varies between the federal government and differing tribes has made the process so bureaucratically complex that it has “dissuaded” the telecom industry from installing broadband on Native American lands (Bissell 141-142; Gayles; Margolin 3-4). This is clearly an instance of where the trust relationship between the federal government and Native American nations impedes Native American sovereignty.

To address these issues, organizations, tribes, and policy makers have looked towards advancing wireless technologies, and through this process have theorized the Native sovereignty of the air over their lands (Twist). Unfortunately, pilot studies of these

alternatives have proven to be costly, unreliable, and unsustainable (Gordon, Gordon, and Dorr 432). This, however, may change as technologies continue to improve.

When it comes to electronic communications infrastructure and all the negative and positive possibilities that are encoded by this network technology, it is currently apparent that the digital divides us. Native American nations have sent a clear self-determined message to corporations and the federal government that this issue must be resolved because it is imperative for indigenous sovereignty and nation building. In many cases, Native American Nations have also taken it upon themselves to establish their own telecommunications corporations; meanwhile, the FCC and corporations continue to work with Native American Nations to resolve this divide.

In the United States and in places around the world, whether indigenous peoples are able to solve the digital divide issue through their own self-determination or not, corporate tech giants such as Google and Facebook have their own plans to deploy high speed Internet access with aspirations of bringing the whole world online. For those of us working to operationalize indigenous technological sovereignty in all its diverse forms, we must ask the critical question: What are the political and economic motives that drive the ambitions and intentions of these corporations to deploy communications technology so that every human on earth has access to the Internet? We must also ask: What values and products do these corporations intend on proliferating within our lives in the process of deploying Internet throughout the entire world? Lastly we must try to anticipate answers to the question: What are the potential colonial and emancipatory consequences associated with these corporate values and products? The only way we can adequately

answer these questions as indigenous peoples is by educating ourselves about emerging pervasive media technologies. Even if governments by indigenous peoples are able to self-determine the establishment of infrastructure supporting these technologies, we must still educate ourselves to operationalize Tecno-Sovereignty.

Tecno-Sovereignty requires access to technological media and mediums. Just as importantly, it also requires building digital and critical media literacies capacities through culturally responsive learning. Most importantly, Tecno-Sovereignty cannot be achieved without culturally responsive digital media and learning. By culturally responsive digital media and learning, I am referring to an indigenous pedagogy that supports the development of literacies capacities that provides peoples with the tools to critically engage all technologies, including those grounded in the values encoded by indigenous knowledge systems. Unfortunately, as part of this equation for capacity building pedagogy, the lack of digital media and learning in Indian Country also creates the digital divide. Furthermore, according to a recent article published by the Association of Computing Machinery, between 1985 and 2005 Native Americans represented an increase from 0.4% to 0.5% of the total number of computer science bachelors degrees awarded in the United States (Varma 137). This statistic was reported as low in comparison to the Native American population and other minorities, and is associated to “ a combination of factors, such as lack of access to advanced computer science courses and curricula, lack of teacher preparation, and lack of culturally responsive learning. (Kafai et al., “Ethnocomputing” 241)

Throughout the rest of this essay I will respond to the final aforementioned factor by presenting a case study that demonstrates the complex issues associated with developing culturally responsive digital media and learning for American Indian middle school youth at a Native American community charter school. This case study illuminates issues that may be applicable to other indigenous communities. In all cases, this study predicts that there are complicated and far-reaching implications for indigenous peoples as pervasive media advances across geographies throughout the world.

In Chapter 5 of this dissertation, I present a worked example called “E2textiles: Ethno Electronic Textile Designs for Broadening Participation in Computing for American Indian Youth, Teachers, and Communities.” To briefly recap, this worked example exhibits research that introduces middle school American Indian youth to computing by taking a culturally responsive approach to digital media and learning. This research was lead by education scholars Yasmin Kafai and Bryan Brayboy, and co-investigated by graduate research assistants Kristin Searle and Cristóbal Martínez (me).

For our culturally responsive digital media and learning research, we collaborated with a Native Studies middle school teacher I will refer to in this essay as Mr. Reuben. With Mr. Reuben we developed and taught digital media and learning that situated computer science learning within the context of Native Studies. For this pedagogy to be culturally responsive, students learned through the hands-on acquisition of digital literacies skills by designing and constructing artistic electronic textiles, which are textiles infused with electronic technologies. For more information regarding this research, if necessary, please refer back to the learning section in Chapter 5.

The aspect of our research that I will focus on to conclude this dissertation is a series of workshops that took place during each quarter throughout the 2013–2014 academic year. Throughout the year, Native Studies was taught quarterly to a new group of students. In total, we worked with seventy-six 7th and 8th grade students (47 females, 29 males) over four quarters. Prior to each quarter, we collaborated with Mr. Reuben to design learning that connected with cultural themes he had planned for each quarter. These themes included learning that was scaled around indigenous knowledge about natural elements, plants, animals, and traditional foods.

Given this brief context and the more detailed description of research provided in Chapter 5, I will now present the following case study as a narrative constructed from a series of post-workshop interviews with Mr. Reuben, which took place toward the end of each quarter. I am presenting this case study to highlight some of the complex issues regarding the potential ways that the digital divides us both internally as individuals and across community. My hypothesis is that this divide is the result of competing Discourses, which in this case study are systemic of both colonization and self-determination. Highlighting this complexity provides valuable insights regarding the challenges that indigenous peoples might encounter when considering the pedagogical aspects of indigenous technological self-determination and sovereignty.

As I have argued throughout this dissertation, scholars of technology report that technologies encode values, and that these values have profound political implications for society. Furthermore, society at large has created several dominant Western-Scientific-Judeo-Christian perceptions of technology, such as the towering utopian perspective that

technology equals progress. This Western value, for example, differs considerably with many indigenous traditional values and ethics. In terms of technology and utopia, “techtopian” values espouse that technological advancement is the natural order of human progress. By its very nature, this techtopian value asserts a dominating positivism that occludes what I would argue is a very much needed: “...critical reflection on the effects of technology” (Gee, Hull, and Lankshear 36).

According to digital media and learning research by my colleagues and I at a local Native American community, dominant perceptions and marketplace value systems seem to create yet another node of exclusion for indigenous peoples (Kafai et al. “Ethnocomputing;” Kafai et al. “E2Textiles;” Martínez et al. “Ethno E-textiles”). In our research, we found that indigenous youth who use digital media in their daily lives disassociate emerging digital technologies from aspects of their identities by asserting that digital/electronic media is not a part of their culture. They further assert that technology itself is not part of their culture, despite a rich long-view heritage of desert architecture, agriculture, tools, hydrology, and more.

Perhaps these attitudes by students exist because they do not see digital media as encoding the values of their people. In order for the digital divide to narrow, and for Tecno-Sovereignty to advance, these perceptions must change through indigenous self-determined capacity building, and technology itself must be transformed to encode the values of indigenous peoples. To build capacity, allowing youth to see themselves in the technology, my colleagues and I recommend culturally responsive digital media and

learning that includes indigenous ethics and values in relation to designs and uses of tools. To conclude, I will support our recommendation with the following case study.

During the 2013-2014 school year, I along with three other researchers (Yasmin Kafai, Bryan Brayboy, and Kristin Searle) conducted a three-week digital media and learning workshop using an electronic textiles construction kit in four separate sections of a Native Studies course for middle school students at a local Arizona Native American community. Students used a construction kit during the workshops to build and program wearable circuits into fabric. In total, we worked with seventy-six 7th and 8th grade students (47 females, 29 males) over four quarters. Working with the Native Studies teacher and his aide, we designed each quarter around a culturally relevant theme connected to additional course material.

Themes included elements, plants, animals, and traditional foods. Each student chose a design related to their class theme and then created a electronic textiles artifact using LEDs, an Arduino microcontroller, conductive thread, conductive fabric, and felt. To complete their designs, students had to write computer algorithms and upload their computer code to the microcontroller in order to program the lights to blink according to how they wanted the lights to behave. As part of these workshops, we sought to provoke students to consider their relationships to electronic technology and how these relationships may be informed by indigenous knowledge systems, which include local community knowledge, values, and technology practices.

For the purposes of this research, I will be presenting and analyzing data that my fellow researchers and I collected through face-to-face interviews with one of our

community partners — the middle school Native Studies teacher who I will refer to in the following paragraphs as Mr. Reuben. There are a total of four post-workshop interviews that took place throughout the 2013-2014 school year using an interview protocol designed to document Mr. Reuben's varying perceptions and attitudes about electronic technology throughout the course of the school year. Through these interviews, Mr. Reuben, a teacher who is Native American, provides us his perspectives on technology and Digital Media and Learning in the context of his Native Studies class.

Starting at the most basic level, Mr. Reuben shares with us that it is difficult to reconcile digital media learning with Native Studies when “technology,” a signifier of electronic technology, is in relation to local Native American traditions. At the same time he also concedes that local designs and uses of technology, regardless of whether they are electronic or not, defy the students' and his own perceptions that electronic technology and Native traditions are mutually exclusive from one another.

Throughout the academic year, Mr. Reuben reflects upon the vexing dilemmas associated with Discourses of colonization, self-determination, tradition, and daily practice and how they create in the community competing binary perceptions of old vs. new, which don't appear to reflect the daily practices or behaviors of his students.

To provide some context regarding Mr. Reuben's Native Studies classes, he describes his courses as a place where he hopes to provide students with the opportunity to think about, on their own terms, their place as Native Americans in relation to what he describes as the outside world. According to Mr. Reuben, his courses are “...really about Natives kind of finding their way with society...like on their own terms, on Native

terms.” For Mr. Reuben, providing his students with the opportunity to learn how to apply indigenous self-determination to develop their own understanding of the world requires a Native pedagogy that focuses on Native ways of knowing, which includes what he refers to as “...basic concepts of seeing what’s alive, what’s a living force, how things are related, how things are connected, what [are] Native beliefs.” Mr. Reuben states that these relationships and connections are referred to in the community as “Native Knowledge.”

When asked about the role technology plays in how he teaches Native Studies, Mr. Reuben illustrates that he uses technology intensively and states that technology is helpful in teaching his Native Studies courses, citing that he uses projectors, smart-boards, audio, digital content produced by the tribe, and just about everything he has access to. Furthermore, Mr. Reuben describes the importance of providing his students with multi-modal learning experiences such as the opportunity to listen to and see local indigenous vocabulary via digital media. Mr. Reuben articulates that he needs technology to help support his ideas, and goes on to further state that his use of technology fits a Native philosophy that “you need a little bit of everything to survive.”

Although Mr. Reuben uses technology and appropriates technology in his classroom by grounding it in a Native philosophy, he also concedes that, once he starts to think about technology in the context of traditions or the things that are considered “traditional,” for him it is difficult to see technology as part of Native American culture. This becomes a structural dilemma when thinking about the possibilities for designing culturally responsive digital media and learning, because in the context of Mr. Reuben’s

class the content is largely designed to support his teaching of Native American culture. The dilemmas are striking when observing the competing cultural and philosophical Discourses associated with connecting digital media and learning to courses on Native American culture, especially because it is difficult to ignore the fact that Mr. Reuben teaches most of his course content using digital media tools like smart boards, projectors, audio, computers, etc.

Mr. Reuben's perceptions of technology also reflect student perceptions. While Mr. Reuben sees the complexity and contradictions that stem from competing Discourses of technology, Martínez, Brayboy, Searle, and Kafai report at DML 2014 that it is more difficult for students to see a connection between technology and their culture than it is for adults in their community, and that students articulated their culture as fixed in the past. Meanwhile, like Mr. Reuben, students are using electronic technology throughout their daily lives, including the smartphones that most of them are carrying in their pockets. Mr. Reuben states, "It's not two different things [meaning technology and Native culture]...you can't talk about technology like it's a separate thing..." Mr. Reuben states that the binary discourse does not reflect what is in the people's daily lives. He goes on to make a key point, that the issue is one of self-determination in which Native Americans need to decide for themselves the implications of technology.

Mr. Reuben states that in his experience there seems to be a prevailing perception among community members that "...if it was made after the 1900s, it wasn't Native technology." He also explains that he found it interesting that many of his students felt that, if a technology is appropriated, it is still not a Native technology, but that, if a

technology originated from a Native community, then it was Native, even if it was appropriated and modified by non-Native people. In response to this student perception, Mr. Reuben states, “I think it's unfortunate because they aren't considering how things adapt and how things are incorporated [into culture], and the fact that it's like Natives aren't like resistant to change, but if they want to bring something in, I think in the past they just wanted to do it in a responsible way. They wanted to be respectful of whatever they incorporated in. And that's the point I was trying to drive in, [that] you always want to have that element of respect if you bring something in.” When analyzing Mr. Reuben’s discourse, this statement becomes a key for understanding these aforementioned tensions between community notions of technology and tradition.

Once Mr. Reuben made it clear, through the aforementioned statement and examples he provided, that the community historically has not hesitated to appropriate technology, and that technologies appropriated by the community have become Native technologies, it started to become apparent why many Native Americans no longer saw technologies after the 1900s as Native. One striking distinction is that, for example, in the local Arizona Indian Community, various technologies prior to the 1900s did not, for the most part, involve electricity or the electronic manipulation of high velocity media.

When considering Mr. Reuben’s statement, the issue isn’t necessarily associated to the property of electricity itself, but perhaps has more to do with the values that electronic technology encodes. Mr. Reuben is concerned about these values and how they connect with a community desire to be respectful and responsible when incorporating

electronic technologies into their cultural frameworks. I will explicate this conclusion in the following few paragraphs.

The purpose of the following paragraphs is not to debate the legitimacy of Mr. Reuben's claims, but to highlight them because they provide some possible insights into the ways some indigenous peoples might perceive digital media. Mr. Reuben is not speaking on behalf of any community, but his perspectives as an indigenous person may shed some light on some of the issues that indigenous peoples might consider when creating culturally responsive digital media and learning pedagogies.

Throughout the interviews, Mr. Reuben provides some insight into concerns and reservations that he has regarding technology. Most of his concerns relate to the idea that an indigenous person should be respectful and responsible when incorporating new technologies as part of existing cultural frameworks. Mr. Reuben unwaveringly reiterates this value during the post-workshop interviews throughout the entire academic year. He cites the embedded obsolescence of today's technology and argues that this disposable design paradigm is not an excuse for being irresponsible. Mr. Reuben always clarifies that, if digital media is going to fit within a Native context, indigenous people must be responsible and accountable in their creations and applications of this technology. Examples that Mr. Reuben cites to illustrate irresponsible uses of technology include cyber bullying, the replacement of looking something up on the Internet instead of seeking out answers through face-to-face conversational inquiries, and parents ignoring their children because they are too focused on their smartphones.

At the same time that Mr. Reuben provides us with a clear framework for how digital media can become Native, or part of local Native American culture, he also continues to struggle with understanding how our electronic textiles workshops fit into his Native Studies pedagogy, and he communicates his fears regarding how digital media impacts traditions. He articulates that a purist attitude towards technology doesn't really exist, and that such a view can be detrimental to self-determination and sovereignty because it doesn't reflect the lived experiences of youth, and adults. He offers that, even though a purely traditional indigenous life doesn't exist, he experienced, in his youth, nostalgia for such an idea.

Early on, Mr. Reuben articulates that one important thing about digital media and learning in a Native Studies class is the fact that it provokes and provides a framework for Native Americans to engage these vexing issues of tradition and technology instead of simply ignoring the reality that they are not separate. He cites his observation that, once students start to articulate binaries, they eventually get to a place in their reasoning where it becomes increasingly difficult to inscribe these boundaries, and that in trying to do so "... they're almost chasing their tail on some of their own answers." Mr. Reuben states that, outside his Native Studies digital media and learning workshops, conversations of traditions and technology don't really seem to happen.

After three workshops of electronic textiles in Native Studies, my fellow researchers and I began to consider Mr. Reuben's message, along with an early presentation we made to the community's education board, which was our proposal to create double bottom line learning with a culturally responsive digital media and learning

pedagogy that provided students with the opportunity to engage both critically and technically with electronic technology, and through the process of building digital literacies skills have the opportunity to learn about local cultural knowledge, and vice versa. Throughout the entire year, we collaborated with Mr. Reuben to try to figure out how to achieve this goal. Most of our focus throughout the year was based upon cultural learning content. After some learning with this approach, we finally came upon a solution for culturally responsive digital media and learning that made sense to Mr. Reuben.

During our final pre-planning workshop with Mr. Reuben, my fellow researchers and I proposed an idea that we would use the final workshop to teach indigenous values articulated in a Critical Indigenous Research Methodology, which are respect, relationships, reciprocity, and responsibility (the 4Rs) (Brayboy et al. 423-424). All of these values respond to the feedback that Mr. Reuben had been articulating throughout the year. By moving our focus toward values in the medium, we created a learning environment requiring students to engage in peer-to-peer mentoring based on a practice of the 4Rs. We also provided students with a learning curriculum that challenged them to consider the role of the 4Rs as an ethical framework for the design of their electronic textiles, as well as the ways they use technology in their daily lives.

The outcomes of this idea were dramatic. Students gathered together in group circles and began to help each other out, reducing the load on the teachers and transforming the learning environment from a traditional classroom into what began to look more like a peer-to-peer learning community. This aspect of the narrative might offer an important key towards culturally responsive indigenous digital media and

learning, and is an important capacity building recommendation moving forward: that culturally responsive digital media and learning for indigenous youth isn't only about digital literacies skills and cultural content instruction, but perhaps most importantly it is about teaching a practice of values in the medium. This is the essence of Tecno-Sovereignty, because learning and encoding values through the creation and use of technology are what inscribe the human behaviors necessary for indigenous sovereignty.

This valuable research finding answers the critique of schooling by Native American scholar Vine Deloria Jr. who states: "Education today trains professionals but it does not produce people" (Deloria Jr., "Knowing and Understanding" 43). In a culturally responsive pedagogy, education is the inverse, in that it focuses on producing people who strive to be ethical in their personal and professional lives.

At the end of the academic year we conducted one final interview with Mr. Reuben during which time he articulates the following:

"When you guys brought in the Four R's, I think that added another element. I was like, yeah, that makes a lot of sense now because that almost — to me, it almost felt like it tied it in kind of full swing where it's like, yeah, you easily apply that to electronics and that's now molding it the Native way of being."

REFERENCES

- Adorno, Theodore and Max Horkheimer. "The Culture Industry: Enlightenment as Mass Deception. (1944)" *Dialectic of Enlightenment*. Trans. John Cumming. London: Verso, 1979. Print.
- Aleiss, Angela. *Making the White Man's Indian: Native Americans and Hollywood Movies*. Westport: Praeger, 2005. Print.
- Alessio, Dominic, and Kristen Meredith. "Decolonizing James Cameron's Pandora: Imperial History and Science Fiction." *Journal of Colonialism and Colonial History* 13.2 (2012): n. pag. Web. 13 Oct. 2014.
- Alfred, Taiaiake. *Wasáse: Indigenous Pathways of Action and Freedom*. Peterborough, ON: Broadview, 2005. Print.
- Alfred, Taiaiake. "Sovereignty." *Sovereignty Matters*. Ed. Joanne Barker. Lincoln: University of Nebraska Press, 2005. 33-50. Print.
- Allen, Nancy, Paul Resta, and Mark Christal. "Technology and Tradition: The Role of Technology in Native American Schools." *TechTrends* 46.2 (2002): 50-55. Print.
- Altheide, David L. "An Ecology of Communication." *Sociological Quarterly* 35.4 (1994): 665-683. Print.
- Anzaldúa, Gloria. *Borderlands / La Frontera: The New Mestiza*. San Francisco: Aunt Lute Books, 1987. Print.
- Archibald, Jo-ann. "Coyote's Story about Orality and Literacy." *Canadian Journal of Indian Education* 17.2 (1990): 66-81. Print.
- Archibald, Jo-ann. *Indigenous Storywork: Educating the Heart, Mind, Body, and Spirit*. Vancouver and Toronto: UBC Press, 2008. Print.
- Arden, Tracy. "Is 'Apocalypto' Pornography?" *Archeology: A publication of the Archeological Institute of America* (2006): n. pag. Web. 10 Jan. 2015.
- Armstrong, Virginia Irving and Frederick W. Turner III. *I have spoken: American History Through the Voices of Indians*. Chicago: Swallow Press, 1971. Print.
- Arnold, David. "Europe, Technology, and Colonialism in the 20th Century." *History and Education: An International Journal* 21.1 (2005): 85-106. Print.
- Bainbridge, David I. "Hacking. The Unauthorized Access of Computer Systems; The Legal Implications." *The Modern Law Review* 52.2 (1989): 236-245. Print.

- Barber, Richard. "Hackers Profiled — Who Are They and What are Their Motivations?" *Computer Fraud and Security* 2001.2 (2001): 14-17. Print.
- Bardzell, Shaowen. "Utopias of Participation: Design, Criticality, and Emancipation." PDC '14. Hotel Safari, Windhoek, Namibia. 10 Oct. 2014. Keynote Address.
- Barnhardt, Ray and Oscar A. Kawagley. "Indigenous knowledge systems and Alaska Native ways of knowing." *Anthropology and Education Quarterly* 36.1 (2005): 8-23. Print.
- Barrionuevo, Alexei. "Tribes of Amazon find an Ally Out of *Avatar*." *New York Times* 10 Apr. 2010: A1. Print.
- Basso, Keith H. *Wisdom Sits in Places: Landscape and Language Among the Western Apache*. Albuquerque: University of New Mexico Press, 1996. Print.
- Bataille, Gretchen, ed. *Native American Representations: First Encounters, Distorted Images, and Literary Appropriations*. Lincoln: University of Nebraska Press, 2001. Print.
- Battiste, Marie. "Indigenous knowledge and pedagogy in first nations education: A literature review with recommendations." Ottawa, Ontario, Canada: Indian and Northern Affairs Canada, 2002. Print.
- Baudrillard, Jean. "Requiem for the Media. (1972)" *The New Media Reader*. Eds. Noah Wardrip-Fruin and Nick Montfort. Cambridge, MA: MIT Press, 2003. 277-283. Print.
- Baudrillard, Jean. *Simulacra and Simulation*. Trans. Sheila Faria Glaser. Ann Arbor: The University of Michigan Press, 1994. Print.
- Beck, Peggy V., Anna Lee Walters, and Nia Francisco. *The Sacred: Ways of Knowledge, Sources of Life*. Tsale: Navajo Community College Press, 1992. Print.
- Bell, Derrick. "Racial Realism." *Connecticut Law Review* 24.2 (1992): 363-379. Print.
- Bell, Derrick. "The power of narrative." *Legal Studies Forum* 23 (1999): 315-348. Print.
- Bercovitch, Sacvan. *The American Jeremiad*. Madison: University of Wisconsin Press, 1978. Print.
- Best, Kirsty. "Visceral Hacking or Packet Wanking? The Ethics of Digital Code." *Culture, Theory, and Critique* 47.2 (2006): 213-235. Print.

- Bialik, Carl. "What does it Cost Amazon.com to Go Dark?" The Wall Street Journal, 10 July 2008. Web. 14 October 2014.
- Biolsi, Thomas, and Larry Zimmerman, eds. *Indians and Anthropologists: Vine Deloria Jr., and the Critique of Anthropology*. Tucson: University of Arizona Press, 1997. Print.
- Birchfield, David, et al. "Embodiment, Multimodality, and Composition: Convergent Themes Across HCI and Education for Mixed-Reality Learning Environments." *Journal of Advances in Human-Computer Interaction* 2008 (2008): 1-19. Print.
- Bissell, Therese. "The Digital Divide Dilemma: Preserving Native American Culture While Increasing Access to Information Technology on Reservations." *Journal of Law, Technology, & Policy* 2004 (2004): 129-150. Print.
- Blaeser, Kimberly M. *Gerald Vizenor, Writing in the Oral Tradition*. Norman: University of Oklahoma Press, 1996. Print.
- Blair, Carole, Greg Dickinson, and Brian Ott. "Introduction: Rhetoric/Memory/Place." *Places of Public Memory: The Rhetoric of Museums and Memorials*. Tuscaloosa: University of Alabama Press, 2010. 1-56. Print.
- Bohm, David. *On Dialogue*. New York: Routledge, 1996. Print.
- Bombardieri, Marcella. "The inside story of MIT and Aaron Swartz." *BOSTONGLOBE.com*. The Boston Globe, 30 Mar. 2014. Web. 16 December 2014.
- Bonilla-Silva, Eduardo. "Rethinking racism: Toward a structural interpretation." *American Sociological Review* 62.3 (1997): 465-480. Print.
- Boyle III, Clifton J. *The Effectiveness of a Digital Citizenship Curriculum in an Urban School*. Diss. Johnson and Wales University, 2010. Ann Arbor: UMI, 2010. Print.
- Bratton, Benjamin H. Introduction. *Speed and Politics*. By Paul Virilio. Los Angeles: Semiotext(e), 2006. 7-25. Print.
- Brayboy, Bryan McK. J. Arizona State University Graduate Class. Fall 2009.
- Brayboy, Bryan McK. J. "Indigenous Knowledge Systems Conference Presentation." University of Pennsylvania 35th Annual Ethnography in Education Research Forum, Philadelphia, February 28, 2014. Panel Presentation.
- Brayboy, Bryan McK. J. "Toward a tribal critical race theory in education." *Urban Review* 37.5 (2005): 425-446. Print.

- Brayboy, Bryan McK. J., and Angelina Castagno. "How Might Native Science Inform "Informal Science Learning?" *Cultural Studies of Science Education* 3 (2008): 731-750. Springer. Web. 15 Jan. 2010.
- Brayboy, Bryan McK. J., and Emma Maughan. "Indigenous Knowledges and the Story of the Bean." *Harvard Educational Review* 79.1 (2009): 1-21. Print.
- Brayboy, Bryan McK. J., Gough, Heather R., Leonard, Beth, Roehl, Roy F., and Jessica A. Solyom. "Reclaiming Scholarship: Critical Indigenous Research Methodologies." *Qualitative Research: An Introduction to Methods and Design*. Ed. Stephen D. Lapan, MaryLynn T. Quartaroli, and Frances J. Reimer. San Francisco: Jossey-Bass, 2012. 423-450. Print.
- Bright, Brenda. "'Heart Like a Car:' Hispano/Chicano Culture in Northern New Mexico." *America Ethnologist* 25.4 (1998): 583-609. Print.
- Bumiller, Elisabeth and Thom Shanker. "Panetta Warns of Dire Threat of Cyberattack on U.S." *NYTimes.com*. The New York Times, 11 Oct. 2012. Web. 18 December 2014.
- Burning Wagon Productions. *Imperial Silence*. 2012. Museum of Contemporary Art Chicago, Chicago. Photos by Gordon Huang. *Museum of Contemporary Art Chicago*. Web. 23 February 2015.
- Byrne, Cormac. "Irish 'drunk' sours launch of hit game." *The Evening Herald*. 20 May 2010. Web. 15 Apr. 2012.
- Cajete, Gregory. *Native Science: Natural Laws of Interdependence*. Santa Fe: Clear Light, 2000. Print.
- Cajete, Gregory. *Spirit of the Game: An Indigenous Wellspring*. Skyland: Kivaki Press, 2005. Print.
- Cajete, Gregory. "The Struggle and Renaissance in Indigenous Knowledge in Eurocentric Education." *Indigenous Knowledge and Education: Sites of Struggle*. Ed. Villegas, Malia, Sabina Rak Neugebauer, and Kerry R. Venegas. Cambridge, MA: Harvard Educational Review Reprint Series No. 44, (2008): 85-92. Print.
- Calvo, William. *Lowriders: Cruising the Color Line*. Diss. Arizona State University, 2011. ProQuest. PDF file.
- Carey, James W. *Communication as Culture: Essays on Media and Society*. New York: Routledge, 1992. Print.

- Carr, David. "How the Hacking at Sony Over 'The Interview' Became a Horror Movie." *NYTimes.com*. The New York Times, 21 Dec. 2014. Web. 18 January 2014.
- Casey, Edward. "Place Memory." *Remembering: A Phenomenological Study*. 2nd Ed. Bloomington: Indiana UP, 2000. 181-385. Print.
- Castagno, Angelina, and Bryan McK. J. Brayboy. "Culturally Responsive Learning for Indigenous Youth: A Review of Literature." *Review of Educational Research* 78.4 (2008): 941-993. Print.
- Castro, Rafaela G. *Chicano Folklore: A Guide to the Folktales, Traditions, Rituals and Religious Practices of Mexican Americans*. New York: Oxford University Press, 2000. Print.
- Chappell, Ben. "Lowrider Cruising Spaces." *Mobile Crossings: Representations of Chicana/o Cultures*. Eds. Anja Bandau and Marc Prieue. Germany: Wissenschaftlicher Verlag Trier, 2006. 51-62. Print.
- Chappell, Ben. *Lowrider space: aesthetics and politics of Mexican American custom cars*. Austin, TX: University of Texas Press, 2012. Print.
- Chomsky, Noam. "Psychology and ideology." *Cognition* 1.1 (1972): 11-46. Print.
- Coffey, Wallace and Rebecca Tsosie. "Rethinking the Tribal Sovereignty Doctrine: Cultural sovereignty and the Collective Future of Indian Nations." *Stanford Law & Policy Review* 12.2, (2001): 191-221. Print.
- Cohen, Patricia. "Oxfam Study Finds Richest 1% Is Likely to Control Half of Global Wealth by 2016." *NYTimes.com*. The New York Times, 19 Jan. 2015. Web. 18 February 2015.
- Coleman, E. Gabriela. *Coding Freedom: The Ethics and Aesthetics of Hacking*. Princeton: Princeton UP, 2012. Print.
- "Company develops Native language aps for iPod." *Native American Times* [Tulsa, Oklahoma] 14 Aug 2009. Print.
- "Connecting America: The National Broadband Plan." *FCC.gov*. Federal Communications Commission. 17 Mar. 2010. Web. 25 May 2012.
- Cook-Lynn, Elizabeth. "History, myth, and identity in the new Indian story." *Handbook of critical and indigenous methodologies*. Eds. Norman Denzin, Yvonne Lincoln, and Linda Tuhiwai Smith. Thousand Oaks, CA: SAGE Publications, 2008. 329-346. Print.

- Crawford, Jamie. "The U.S. government thinks China could take down the power grid." *CNN.com*. Cable News Network, 21 Nov. 2014. Web. 16 December 2014.
- Creative Commons*. Creative Commons, 2014. Web. 17 Dec. 2014.
- Crenshaw, Kimberle Introduction. *Critical Race Theory: The Key Writings That Formed the Movement*. By Kimberle Crenshaw, Neil Gotanda, Gary Peller, and Kendall Thomas. New York, The New Press, 1996. xiii-xxxii. Print.
- Damasio, Antonio R. *Descartes' Error: Emotion, Reason, and the Human Brain*. New York: G. P. Putnam's Sons, 1994. Print.
- "Data: Population, Total." *The World Bank*. The World Bank Group. n.d. Web. 17 February 2014.
- Davidson-Hunt, Iain J. and R. Michael O'Flaherty. "Researchers, Indigenous Peoples, and Place Based Learning Communities." *Society and Natural Resources* 20 (2007): 291-305.
- de la Peña, Carolyn. "The History of Technology, the Resistance of Archives, and the Whiteness of Race." *Technology and Culture* 51.4 (2010): 919-937. Print.
- Delgado, Richard. "Storytelling for oppositionists and others: A plea for narrative." *Critical race theory: The cutting edge*. 2nd ed. Eds. Richard Delgado and Jean Stefancic. Philadelphia: Temple Press, 2000. 60-70. Print.
- Deloria Jr., Vine. *Custer Died For Your Sins*. 1969. New York: Macmillan, 1988. Print.
- Deloria Jr., Vine. "Knowing and Understanding." *Power and Place*. Eds. Vine Deloria Jr., and Daniel Wildcat. Golden, CO: Fulcrum Resources, 2001. 44-46. Print.
- Deloria Jr., Vine. *Red Earth, White Lies*. Golden: Fulcrum Publishing, 1997. Print.
- Deloria Jr., Vine. *We Talk, You Listen*. New York: Macmillan, 1970. Print.
- Deluse, Gilles and Félix Guittari. *A Thousand Plateaus: Capitalism and Schizophrenia*. Trans. Brian Massumi. Minneapolis: University of Minnesota Press, 1987. Print.
- Denegri-Knott, Janice, Detlev Zwick, and Jonathan E. Schroeder. "Mapping consumer power: and integrative framework for marketing and consumer research." *European Journal of Marketing* 2006: 40.9/10, 950-971. Emerald. PDF file.
- Dewey, John. *Art as Experience*. 1932. New York: Perigree, 2005. Print.

- Diamond, Jared. *Guns, Germs, and Steel: The Fates of Human Societies*. New York: Norton, 1999. Print.
- Dourish, Paul. "‘Being in the World’: Embodied Interaction." *Where the Action Is*. Cambridge: MIT Press, 2001. 99-126. Print.
- Doxtater, Michael G. "Indigenous Knowledge in the Decolonial Era." *American Indian Quarterly* 28.3/4 (2004): 618-633. Print.
- Dudek, Debra and Nicola Johnson. "Return of the Hacker as Hero: Fictions and Realities of Teenage Technological Experts." *Children’s Literature in Education* 42.3 (2011): 184-195. Print.
- Duke, Alan. "James Cameron joins real-life *Avatar* battle." *CNN.com*. Cable News Network, 20 Apr. 2010. Web. 31 November 2014.
- "Edward Snowden and the NSA files timeline." *THEGUARDIAN.com*. The Guardian News, 21 August 2013. Web. 16 Dec. 2014
- "Edward Snowden: the whistleblower behind the NSA surveillance revelations." *THEGUARDIAN.com*. The Guardian News, 11 June 2013. Web. 16 Dec. 2014
- Elthie, Gary, and Rebecca Schubert. "Pinion gets Extreme Makeover." *Navajo-Hopi Observer*. Western News and Info. Inc., 24 Apr. 2007. Web. 18 Dec. 2014.
- Enzensberger, Hans M. "Constituents for a Theory of the Media. (1970)" *The New Media Reader*. Eds. Noah Wardrip-Fruin and Nick Montfort. Cambridge, MA: MIT Press, 2003. 259-275. Print.
- Erickson, Jon. *Hacking: The Art of Exploitation*. 2nd ed. San Francisco: No Starch, 2008. Print.
- Feld, Steven and Keith Basso. Introduction. *Senses of Place*. Eds. Steven Feld and Keith Basso. Santa Fe: School of American Research Press, 1997. 3-11. Print.
- Fine, Gary Alan. "TEN LIES OF ETHNOGRAPHY: Moral Dilemmas of Field Research." *Journal of Contemporary Ethnography* 22:267 (1993): 267-294. Print.
- Flower, Linda. *Community Literacy and the Rhetoric of Public Engagement*. Carbondale: Southern Illinois University Press, 2008. Print.
- Flower, Linda, Elenore Long, and Lorraine Higgins. *Learning to Rival: A Literate Practice for Intercultural Inquiry*. Mahwah, NJ: Lawrence Erlbaum Associates, 2000. Print.

- Flowers, Stephen. "Harnessing the hackers: The Emergence and Exploitation of Outlaw Innovation." *Research Policy* 37, (2008): 177-193. Print.
- Foucault, Michel. "Of Other Spaces." Trans. Jay Miskowiec. *Diatrics* 16.1 (1986): 22-27. Web. 24 July 2013.
- Freidel, David. "Betraying the Maya." *Archaeology* 60.2 (2007): 36-41. Print.
- Freire, Paulo. *Pedagogy of the Oppressed*. 30th Anniversary ed. New York: The Continuum International Publishing Group Ltd., 2009. Print.
- Friedman, Thomas L. *The Lexus and the Olive Tree: Understanding Globalization*. New York: Picador, 2000. Print.
- Fritz, Ben. "Red Dead Redemption brings the western to video games." *LA Times* 25 Apr. 2010. Web. 28 Apr. 2012.
- "'Frontera! Revolt and Rebellion on the Rio Grande' Streaming on PBS.ORG – Q&A with Filmmaker John Jota Leaños." *LPBP.com*. Latino Public Broadcasting, n.d. Web. 12 Mar. 2015.
- Furnell, Steven M., and Matthew J. Warren. "Computer Abuse: Vandalizing the Information Society." *Internet Research* 7.1 (1997): 61-66. Print.
- Gardner-Youden, Holly L et al. "Collaborative Geomatics: A Web-based Tool for Dynamic Indigenous Mapping." *IKTC '2011: Embracing Indigenous Knowledge Systems in a New Technology Paradigm*. November 02-04, Windhoek, Namibia. PDF.
- Gayles, Contessa. "We Native Americans are 'poster children' for no Internet access." *CNN.com*. Cable News Network, 11 Aug. 2014. Web. 3 March 2014.
- Gaylord, Chris. "Red Dead Redemption review roundup." *The Christian Science Monitor*. 17 May 2010. Web. 15 Apr. 2012.
- Gee, James Paul. *The Anti-Education Era: Creating Smarter Students through Digital Learning*. New York: Palgrave Macmillan, 2013. Print.
- Gee, James Paul. Arizona State University Graduate Class. Fall 2011.
- Gee, James Paul. "Discourse and 'the New Literacy Studies.'" *The Routledge Handbook of Discourse Analysis*. Eds. James Paul Gee and Michael Hanford. New York: Routledge, 2012. 371-382. Print.

- Gee, James Paul. *How to do Discourse Analysis: A Toolkit*. New York: Routledge, 2011. Print.
- Gee, James Paul. *An Introduction to Discourse Analysis: Theory and Method*. 3rd ed. New York: Routledge, 2011. Print.
- Gee, James Paul. *New Digital Media and Learning as an Emerging Area and "Worked Examples" as One Way Forward*. Cambridge, Massachusetts: The MIT Press, 2010. Print.
- Gee, James Paul. *Situated Language and Learning: A Critique of Traditional Schooling*. New York: Routledge, 2004. Print.
- Gee, James Paul. *Social Linguistics and Literacies: Ideologies in Discourses*. 4th ed. London and New York: Routledge, 2012. Print.
- Gee, James Paul, Glynda Hull, and Colin Lankshear. *The New Work Order: Behind the Language of the New Capitalism*. Boulder: Westview, 1996. Print.
- Gordon, Andrew C., Margaret Gordon, and Jessica Dorr. "Native American technology access: the Gates Foundation in Four Corners." *The Electronic Library* 21.5 (2003): 428-434. PDF.
- Gorman, Siobhan. "NSA Director Warns of 'Dramatic' Cyberattack in Next Decade." *WSJ.com*. The Wall Street Journal, 20 Nov. 2014. Web. 16 December 2014.
- Grande, Sandy. "American Indian identity and intellectualism: the quest for a new red pedagogy." *Qualitative Studies in Education* 13.4 (2000): 343-359. Print.
- Grande, Sandy. "Red pedagogy: The un-methodology." *Handbook of critical and indigenous methodologies*. Eds. Norman Denzin, Yvonne Lincoln, and Linda Tuhiwai Smith. Thousand Oaks, CA: SAGE Publications, 2008. 233-254. Print.
- Grimshaw, Anna and Keith Hart. "Anthropology and the Crisis of the Intellectuals." *Critique of Anthropology* 14.3 (1994): 227-261. Print.
- Gunkle, David J. "Hacking Cyberspace." *JAC* 20.4 (2000): 797-823. Print.
- Halström, Jonas and Per Gyberg. "Technology in the rear-view mirror: How to better incorporate the history of technology into technology education." *International Journal of Technology and Design Education* 21 (2011): 3-17. Print.
- Haney Lopez, Ian F. "The social construction of race." *Critical race theory: The cutting edge*. 2nd ed. Eds. Richard Delgado and Jean Stefancic. Philadelphia: Temple Press, 2000. 163-175. Print.

- Hansen, Richard D. "Relativism, Revisionism, Aboriginalism, and Emic/Etic Truth: The Case Study of *Apocalypto*." *The Ethics of Anthropology and Amerindian Research: Reporting on Environmental Degradation and Warfare*. Eds. Richard J. Chacon and Ruben G. Mendoza. New York: Springer, 2011. 146-190. Print.
- Harry, Debra, and Le`a Malia Kanehe. "Asserting Tribal Sovereignty Over Cultural Property: Moving Towards Protection of Genetic Material and Indigenous Knowledge." *Seattle Journal for Social Justice* 5.1 (2006): 27-66. Print.
- Hernández-Truyol, Berta Esperanza. "Borders (en)gendered: Normativities, Latinas, and a LatCrit paradigm." *N.Y.U. Law Review* 72 (1997): 882-927. Print.
- Higgins, Lorraine, Elenore Long, and Linda Flower. "Community Literacy: A Rhetorical Model for Personal and Public Inquiry." *Writing and Community Engagement: A Critical Sourcebook*. Eds. Thomas Deans, Barbara Roswell, and Adrian J. Wurr. Boston: Bedford/St. Martin's, 2010. 167-201. Print.
- Hilger, Michael. *The American Indian in Film*. Metuchen: The Scarecrow Press, 1986. Print.
- Hilger, Michael. *From Savage to Nobelman*. Lanham: The Scarecrow Press, 1995. Print.
- Hopkins, Candice. "If History Moves at the Speed of its Weapons. . ." *Coded Territories: Tracing Indigenous Pathways in New Media Art*. Eds. Steven Loft and Kerry Swanson. Calgary: University of Calgary Press, 2014. 109-140. Print.
- Hopkins, Candice. "Making Things Our Own: The Indigenous Aesthetic in Digital Storytelling." *Leonardo* 39.4 (2006): 341-344. Print.
- Houser, Dan. "Interview: Dan Houser Talks Red Dead Redemption." *nowgamer.com*. Bournemouth, UK: Image Publishing, 2010. Web. 15 Apr. 2012.
- Houser, Dan. "Interview with Mike Snider." *USA Today*. 26 May 2010. Web. 15 Apr. 2012.
- Ides, Matthew Allan. *Cruising For Community: Youth Culture and Politics in Los Angeles, 1910-1970*. Diss. University of Michigan, 2009. ProQuest. PDF file.
- "Improving Communications Services for Native Nations by Promoting Greater Utilization of Spectrum over Tribal Lands." *Federal Communications Commission*. n. pag., n.d. Web. 12 February 2015.
- "Indigenous Media." *Still Water for Network Art and Culture*. University of Maine. n.d. Web. 23 April 2009.

Innis, Harold A. "The Bias of Communication." *The Canadian Journal of Economics and Political Science / Revue canadienne d'Economie et de Science politique* 15.4 (1949): 457-476. Print.

Internet.org. Internet.org by Facebook. n. pag., n.d. Web. 18 February 2015.

"Internet Hall of Fame Innovator: Aaron Swartz (Posthumous Recipient)." *INTERNETHALLOFFAME.org*. The Internet Hall of Fame, n.d. Web. 16 December 2014.

"Internet Usage Statistics: The Internet Big Picture." *Internet World Stats: Usage Population Statistics*. Miniwatts Marketing Group. 19 Mar. 2015 Web. 24 March 2015.

"The Interview: A Guide to the cyber attack on Hollywood." *BBC.com*. BBC News, 29 December 2014. Web. 17 Jan. 2015.

Iroquois Nationals Lacrosse. "About Us." *Iroquois Nationals*, Iroquois Nationals Lacrosse. n.d. Web. 12 October 2012.

"ITU Releases 2014 ICT Figures: Mobile-broadband penetration approaching 32 percent, Three billion Internet users by the end of this year." *ITU.int*. United Nations International Telecommunications Union. n. pag., 5 May 2014. Web. 3 March 2015.

Jenkins, Henry. *Convergence Culture: Where Old and New Media Collide*. New York and London: New York University Press, 2006. Print.

Jenkins, Henry, and Mark Deuze. "Editorial: Convergence Culture." *Convergence* 14:1 (2008): 5-12. Print.

Jojola, Ted. "Absurd Reality II: Hollywood Goes to the Indians" *Hollywood's Indian*. Ed. Peter C. Rollins and John E. O'Connor. Lexington: The University of Kentucky Press, (1998): 12-26. Print.

Kafai, Yasmin, Kristin Searle, Cristóbal Martínez, and Bryan Brayboy. "Ethnocomputing with Electronic Textiles: Culturally Responsive Open Design to Broaden Participation in Computing in American Indian Youth and Communities." *SIGCSE'14*. March 05-08, Atlanta: Association for Computing Machinery, 2014. 241-246. ACM Digital Library. PDF file.

Kafai, Yasmin, Kristin Searle, Cristóbal Martínez, and Bryan Brayboy. "E2textiles: Electronic Textile Designs for American Indian Youth, Communities and Pre-service Teacher Education: NSF Final Report." National Science Foundation Computing Education for the 21st Century (CE 21) Grant (#1150150), 2014. Web.

- Kaplan, Thomas. "Iroquois Lacrosse Team Misses Game in England." *NYTimes.com*. The New York Times, 15 Jul. 2010. Web. 12 February 2015.
- Kawagley, Angayuqaq Oscar. *A Yupiaq Worldview: A Pathway to Ecology and Spirit*. 2nd ed. Long Grove: Waveland Press, Inc., 2006. Print.
- King, Jennifer L. "Increasing Telephone Penetration Rates and Promoting Economic Development on Tribal Lands: A Proposal to Solve the Tribal and State Jurisdictional Problems." B.A., Agnes Scott College, 1998; candidate for J.D., Indiana University School of Law-Bloomington, Indiana, 2000. PDF File.
- Klein, Naomi. *The Shock Doctrine: The Rise of Disaster Capitalism*. New York: Metropolitan, 2007. Print.
- Kolodny, Annette. "Tropic Trappings in Mel Gibson's 'Apocalypto' and Joseph Nicolar's 'The Life and Traditions of the Red Man.'" *American Indian Culture and Research* 32.1 (2008): 21-34. Print.
- Kozinets, Robert V. "Technology/Ideology: How Ideological Fields Influence Consumers' Technology Narratives." *Journal of Consumer Research* 34 (2007): 865-881. Electronic.
- Krueger, Myron W. "Responsive Environments. (1977)" *The New Media Reader*. Eds. Noah Wardrip-Fruin and Nick Montfort. Cambridge, MA: MIT Press, 2003. 259-275. Print.
- Kushner, David. "The Real Story of Stuxnet: How Kaspersky Lab tracked down the malware the stymied Iran's nuclear fuel enrichment program." *IEEE Spectrum*. IEEE, 26 February 2015. Web. 17 Jan. 2015.
- "Lacrosse." *Online Etymology Dictionary*. Online Etymology Dictionary. Douglas Harper, n.d. Web. 15 Jan. 2015.
- Lakoff, George, and Mark Johnson. *Metaphors We Live By*. Chicago: University of Chicago Press, 1980. Print.
- Lameman, Beth Aileen, Jason Edward Lewis, and Skawennati Fragnito. "Skins 1.0: A Curriculum for Designing Games with First Nations Youth." *FuturePlay 2010, 6-7 May 2010, Vancouver*. New York: Association for Computing Machinery, 2010. 105-112. Print.
- Leaños, John J. *Frontera: The First American Revolution*. 2014. Public Broadcasting Service. *PBS Video*. Web. 23 February 2015.

- Lee, Johnny. "Free or cheap Wii Remote Hacks." Online Video Clip. *TED*. TED2008, Feb 2008. Web. 18 Jan. 2015.
- LeDoux, Joseph. *The Emotional Brain*. New York: Simon & Schuster, 1996. Print.
- Leona Okakok. "Serving the purpose of education." *Indigenous Knowledge and Education: Sites of Struggle*. Ed. Villegas, Malia, Sabina Rak Neugebauer, and Kerry R. Venegas. Cambridge, MA: Harvard Educational Review Reprint Series No. 44, (2008): 268-286. Print.
- Lessig, Lawrence. *Code and Other Laws of Cyberspace*. New York: Basic Books, 1999. Print.
- Lessig, Lawrence. *Code: Version 2.0*. New York: Basic Books, 2006. Print.
- Liebelson, Dana. "Ex-Sony Employees Echo Cybersecurity Company's Suspicion That Hack Was An Inside Job." *HUFFINGTONPOST.com*. The Huffington Post, 6 January 2015. Web. 18, Jan. 2015.
- Loft, Steven, and Kerry Swanson, eds. *Coded Territories*. Calgary: University of Calgary Press, 2014. Print.
- Lomawaima, K. Tsianina. "Tribal Sovereigns: Reframing Research in American Indian Education." *Harvard Educational Review* 70.1 (2000): 1-21. Print.
- Long, Pamela. "The Craft of Premodern European History of Technology: Past and Future Practice." *Technology and Culture* 51.3 (2010): 698-714. Print.
- López, Antonio. "Circling the Cross: Bridging Native America, Education, and Digital Media." *Learning Race and Ethnicity: Youth and Digital Media*. Edited by Anna Everett. The John D. and Catherine T. MacArthur Foundation Series on Digital Media and Learning. Cambridge, MA: The MIT Press, 2008. 109–126. Academia. PDF file.
- Lowrider Magazine. January 2013. Print
- Lyons, Scott Richard. "Rhetorical Sovereignty: What Do American Indians Want from Writing?" *College Composition and Communication* 51.3 (2000): 447-468. Print.
- Lyons, Scott Richard. *x-marks: Native Signatures of Assent*. Minneapolis: University of Minnesota Press, 2010. Print.
- Mackay, Hughie and Gareth Gillespie. "Extending the Social Shaping of Technology Approach: Ideology and Appropriation." *Social Studies of Science* 22.4 (1992): 685-716. Print.

- Making Google a workplace for everyone.* Google Inc. Web. 29 Jan. 2015.
- Mandic, Mo. "Being with Technology – Truth, History, Disclosure." *Existential Analysis* 23.3 (2011): 226-236. Print.
- Marazzi, Christian. *The Violence of Financial Capitalism*. New ed. Los Angeles: Semiotext(e), 2011. Print.
- Margolin, Susie. "Launching Tribal Telecoms: A Decision Analysis Toolkit for Tribes: White Paper presented to Native American Telecommunications Association And Vernon James, San Carlos Apache Telecommunications Utilities, Inc." White Paper. Harvard University Native American Program, 2003. PDF.
- Margolis, Jane et al. *Stuck in the shallow end: Education, race, and computing*. Cambridge, MA: MIT Press, 2008. Print.
- Marker, Michael. "Theories and Disciplines as Sites of Struggle: The Reproduction of Colonial Dominance Through the Controlling of Knowledge in the Academy." *Canadian Journal of Native Education* 28.1-2 (2004): 102-110. Print.
- Martínez, Cristóbal, et al. "Culturally Sensible Place-Making: Design of the Mediated XicanIndio Resolana." *TEI '10*, January 24-27, Cambridge, MA, 161-168. ACM. Print.
- Martínez, Cristóbal, Bryan Brayboy, Kristin Searle, and Yasmin Kafai. "Ethno E-textiles for Native American Youth: Building Digital Literacies in Culturally Relevant Ways." Design Agency for Indigenous, Immigrant, and Invisible Youth in Identity Building with Digital Media. Digital Media Learning Conference, Boston, In March 8, 2014. Panel Presentation.
- Martínez, Cristóbal, Randy Kemp, and Lisa Tolentino. "Radio Healer." CHI 2010 April 15, 2010. Atlanta: Association for Computing Machinery, 2010: 3113-3116. ACM Digital Library. PDF file.
- Martinussen, Marie Sneve. "Ingenuity[,] the economy and the environment." 2012. Trøndelag Centre for Contemporary Art, Trøndelag. *System crisis*. n. pag. Exhibition Essay. Print.
- McCain, John. America must fix its cyber-vulnerability. *CNN.com*. Cable News Network. 20 December 2014. Web. 5 Jan. 2015
- McCarty, Teresa, and Tiffany S. Lee. "Critical Culturally Sustaining/ Revitalizing Pedagogy and Indigenous Education Sovereignty." *Harvard Educational Review* 84.1 (2014): 101-124. Print.

- McChesney, Robert. *Digital Disconnect: How Capitalism Is Turning the Internet Against Democracy*. New York: New Press, 2013. Print.
- McLuhan, Marshall. "Understanding Media, The Extensions of Man. (1964)" Corte Madera: Ginko Press, 2003. Print.
- McLuhan, Marshall, and Quentin Fiore. *The Medium is the Massage: An Inventory of Effects*. Produced by Jerome Agel. San Francisco, CA: Hardwired, 1996. Print.
- McMullen, Jennifer. *Regenerating Indigenous Health and Food Systems: Assessing Conflict Transformation models and Sustainable Approaches to Indigenous Food Sovereignty*. Thesis, University of Victoria. Ottawa: Library and Archives Canada, 2012. Print.
- McNiff, Shawn. "Art-Based Research." *Handbook of the Arts in Qualitative Research: Perspectives, Methodologies, Examples, and Issues*. Eds. J. Gary Knowles and Ardra L. Cole. Thousand Oaks, CA: Sage Publications, 2008. 29-40. Print.
- McOmber, James B. "Technological Autonomy and Three Definitions of Technology." *Journal of Communication*, Summer (1999): 137-153. Print.
- Miller, Robert J. *Reservation "Capitalism: Economic Development in Indian Country*. Lincoln and London. University of Nebraska Press, 2012. Print.
- Mitnick, Kevin D., and William L. Simon. *The Art of Intrusion*. Indianapolis: Wiley Publishing, 2005. Print.
- Mizrach, Steve. "Do electronic mass media (especially television) have an adverse impact on Native Americans in the United States?" n. pag. 9 Dec. 1998. Web. 20 April 2009.
- Moñivas, Jesús Romero. "The problem and sociopolitical confusion of 'technological neutrality': The case of the Observatorio de Neutralidad Tecnológica in Spain." *Current Sociology* 59.3 (2011): 310-327. Print.
- Montiel, Miguel, Tomás Atencio, and E. A. "Tony" Mares. *Resolana: Emerging Chicano Dialogues on Community and Globalization*. Tucson: The University of Arizona Press, 2009. Print.
- Mountford, Roxanne. "On Gender and Rhetorical Space." *Rhetoric Society Quarterly* Winter 2001:31.1, 41-47. Jstor. PDF file.
- Moyers, Bill. "Consuming Images." Online Video Clip. *Films On Demand*. Films On Demand, 1989. Web. 20 April 2009.

- Müller, Jens. "An Other Path: Local Systems of Innovation in the South." *Forum for Development Studies* 40.2, (2013): 235-260. Print.
- Müller, Jens. *Making Ends Meet: Local Socio-Technical Transformations in the South*. Aalborg: Aalborg University, 2011. Print.
- MUSAGETES.ca. Musagetes, n.d. Web. 18 January 2015.
- Nango, Joar, and Silje Figenschou Thoresen. "About the indigenuity project." 2012. Trøndelag Centre for Contemporary Art, Trøndelag. *System crisis*. n. pag. Exhibition Essay. Print.
- "Narrowing the Digital Divide in the Navajo Nation" *National Telecommunications & Information Administration*. United States Department of Commerce. 7 Jan. 2014. Web. 3 March 2014.
- Native Nations and Consultation Policy*. Federal Communications Commission. Web. 29 Jan. 2015.
- "NSA collecting phone records of millions of Verizon customers daily." *THEGUARDIAN.com*. The Guardian News, 6 June 2013. Web. 16 Dec. 2014
- Oliveira, K. Katrina-Ann R. Kapā'anaokalāokeola Nākoa. "Wahi A Kahiko: Place Names as Vehicles of Ancestral Memory." *AlterNative* 5.2 (2009): 100-115. Print.
- Okakok, Leona. "Serving the purpose of education." *Indigenous Knowledge and Education: Sites of Struggle*. Ed. Villegas, Malia, Sabina Rak Neugebauer, and Kerry R. Venegas. Cambridge, MA: Harvard Educational Review Reprint Series No. 44, (2008): 268-286. Print.
- Oskal, Nils. "System crisis and ingenuity – Thoughts on indigenuity." 2012. Trøndelag Centre for Contemporary Art, Trøndelag. *System crisis*. n. pag. Exhibition Essay. Print.
- O'Sullivan, Dan, and Tom Igoe. *Physical Computing: Sensing and Controlling the Physical World with Computers*. Mason: Cengage Learning, 2004. Print.
- Pagliery, Jose. "Half of American adults hacked this year." *CNN.com*. Cable News Network, n.d. Web. 18 January 2015.
- Phillips, Tom. "Avatar director James Cameron joins Amazon tribe's fight to halt giant dam." *The Guardian*. Guardian Media Group, 17 April 2010. Web. 31 November 2014.

- Purdy, John. "Tricksters of the Trade: "Remagining" the Filmic Image of Native Americans." *Native American Representations: First Encounters, Distorted Images, and Literary Appropriations*. Ed. Gretchen M. Bataille. Lincoln: University of Nebraska Press, 2001. 100-119. Print.
- Postcommodity. "About" *Postcommodity*, n. pag., n.d. Web. 30 Jan. 2015.
- Postcommodity. *Do You Remember When?* 2012. 18th Biennale of Sydney, Gallery of New South Wales, Sydney. *Postcommodity*. Web. 23 February 2015.
- Postcommodity. *Game Remains: Golden Horseshoe*. 2013. Musagetes Guelph Café, Guelph. *Postcommodity*. Web. 23 February 2015.
- Postcommodity. *If History Moves at the Speed of its Weapons, Then the Shape of the Arrow Is Changing*. 2010. Museum of Contemporary Native Art, Santa Fe. *Postcommodity*. Web. 23 February 2015.
- Postcommodity. *A More Just, Verdant and Harmonious Resolution*. 2011 and 2015. Contour: 5th Biennial of Moving Image, Mechelen, BE. southwestNET: Postcommodity, Pollination, Scottsdale Museum of Contemporary Art, Scottsdale. *Postcommodity*. Web. 23 February 2015.
- Postcommodity. *Mother, Teacher, Destroyer*. 2011. Close Encounters: The Next 500 Years, Winnipeg. *Postcommodity*. Web. 23 February 2015.
- Postcommodity. *Pollination*. 2015. southwestNET: Postcommodity, Pollination, Scottsdale Museum of Contemporary Art, Scottsdale. *Postcommodity*. Web. 23 February 2015.
- Postcommodity. *Repellent Fence*. 2015. Forthcoming, Douglas/Agua Prieta. *Postcommodity*. Web. 23 February 2015.
- Postcommodity. *With Salvage and Knife Tongue*. 2012. Adelaide International 2012, Adelaide. *Postcommodity*. Web. 23 February 2015.
- Powell, Malea. "Rhetorics of survivance: How American Indians Use Writing." *College of Composition and Communication* 53.3 (2002): 396-434. Print.
- "Racism/anti-semitism [sic]." *Gamestop.com*. CBS Interactive. Web. 15 Apr. 2012.
- "Racist or Realistic??" *IGN.com*. Ziff Davis. Web. 15 Apr. 2012.
- Radio Healer*. "Abstract." *Radio Healer*, n. pag. 2013. Web. 18 Apr. 2013.
- Radio Healer*. "Statement." *Radio Healer*, n. pag. 2013. Web. 18 Apr. 2013.

- Radio Healer. *Radio Healer*. 2015. Pueblo Grande Museum, Phoenix. Web. 23 February 2015.
- Raheja, Michelle. "Reading Nanook's Smile: Visual Sovereignty, Indigenous Revisions of Ethnography, and *Atanarjuat (The Fast Runner)*." *American Quarterly* 59.4 (2007): 1159–1185. Print.
- Rainie, Lee, Janna Anderson, and Jennifer Connolly. "Cyberattacks Likely to Increase." *PEWINTERNET.org*. Pew Research Center, 29 Oct. 2014. Web. 16 December 2014.
- Raley, Rita. *Tactical Media*. Minneapolis: University of Minneapolis Press, 2009. Print.
- "Red Dead Redemption Review." *GamesTM*. Bournemouth, UK: Imagine Publishing, n.d. Web. 15 Apr. 2012.
- Richardson, Jayson and Scott McLeod. "Technology Leadership in Native American Schools." *Journal of Research in Rural Education* 26.7 (2011): 1-14. Print.
- Robyn, Linda. "Indigenous Knowledge and Technology: Creating Environmental Justice in the Twenty-First Century." *American Indian Quarterly* 26.2 (2002): 198-220. Print.
- Rodríguez-Alegría, Enrique. "Narratives of Conquest, Colonialism, and Cutting-Edge Technology." *American Anthropological Association* 110.1 (2008): 33-43. Print.
- Rodriguez, Salvador. "60% of the world's population still won't have Internet by the end of 2014." *LATimes.com*. Los Angeles Times, 7 May 2014. Web. 3 March 2014.
- Rollins, Peter C., and John E. O'Connor. eds. *Hollywood's Indian: The Portrayal of the Native American in Film*. Lexington: University of Kentucky Press, 1998. Print.
- Rosenbaum, Ron. "Richard Clark on Who Was Behind the Stuxnet Attack." *Smithsonian.com*. Smithsonian Magazine, Apr. 2012. Web. 17 Jan. 2015.
- Ruuska, Alex. "Ghost Dancing and the Iron Horse: Surviving Through Tradition and Technology." *Technology and Culture* 52.3 (2011): 574-597. Print.
- Sanger, David E. "Document Reveals Growth of Cyberwarfare Between the U.S. and Iran." *NYTimes.com*. The New York Times, 22 Feb. 2015. Web. 10 March 2015.
- Schiesel, Seth. "Way Down Deep in the Wild, Wild West." *New York Times* 17 May 2010: C1. Print.

- Scheiber, Noam. "The Inside Story of Why Aaron Swartz Broke Into MIT and JSTOR." *NEWREPUBLIC.com*. New Republic, n.d. Web. 15 December 2014.
- Schwartau, Winn. *CyberShock: Surviving Hackers, Phreakers, Identity Thieves, Internet Terrorists and Weapons of Mass Disruption*. New York: Thunder's Mouth, 2000. Print.
- Schwartz, John. "Internet Activist, a Creator of RSS, is Dead at 26, Apparently a Suicide." *NYTimes.com*. The New York Times, 12 Jan. 2013. Web. 18 December 2014.
- Scott, David. "Criticism and Culture: Theory and post-colonial claims on anthropological disciplinarity." *Critique of Anthropology* 12.4 (1992): 371-394.
- Sefa-Dei, George J. "Rethinking the Role of Indigenous Knowledges in the Academy." *New Approaches to Life Long Learning*, Working Paper 58, (2002). Print.
- Sennett, Richard. *The Culture of the New Capitalism*. New Haven: Yale Press, 2006. Print.
- Shahani, Aarti. "When Hackers Test For Flaws, They Might Earn Cash – Or Threats." *NPR.org*. National Public Radio, 8 Aug. 2014. Web. 16 Dec. 2014.
- Shahani, Aarti. "Banks Reluctant To Use 'White Hat' Hackers to Spot Security Flaws." *NPR.org*. National Public Radio, 5 Nov. 2014. Web. 16 Dec. 2014.
- Singer, Beverly R. *Wiping the War Paint off the Lens: Native American Film and Video*. Minneapolis: University of Minnesota Press, 2001.
- SMALLab Learning. SMALLab Learning LLC. Web. 18 Jan. 2014.
- "SMALLab Learning Environment." SMALLab Learning. SMALLab Learning LLC. Web. 18 Jan. 2014.
- Smedley, Audrey, and Brian D. Smedley. "Race as Biology Is Fiction, Racism as a Social Problem is Real: Anthropological and Historical Perspectives on the Social Construction of Race." *American Psychologist* 60.1 (2005): 16-26. Print.
- Smith, Heather R. "Junk Yard Genius." *NASA Education*. NASA, 12 Dec. 2007. Web. 18 Dec. 2014.
- Smith, Linda Tuhiwai. *Decolonizing Methodologies: Research and Indigenous Peoples*. London and New York: Zed Books Ltd., 1999. Print.

- "Soft Modding." Presented at the Games + Learning + Society Conference. University of Wisconsin, 11 June 2009.
- "Sovereignty." *Merriam-Webster.com*, Merriam-Webster, n.d. Web. 15 Jan 2015.
- "Sovereignty." *Online Etymology Dictionary*. Online Etymology Dictionary. Douglas Harper, n.d. Web. 15 Jan. 2015.
- Spence, Stephen. "The Revelations of Mel." *American Indian Quarterly* 31.3 (2007): 491-503. Print.
- Stoffle, Richard W., Maria N. Zedeño, and David B. Halmo. "American Indian Worldviews I: "Power" and its connection to people, places, and resources." *American Indians and the Nevada Test Site: A Model of Research and Consultation*. Ed. Richard W. Stoffle, David B. Halmo, Maria N. Zedeño. Washington, D.C.: U.S. Government Printing Office, 2001. 58-76. Print.
- Storni, Cristiano. "The Problem of Design as conjuring: Empower-in-use and the politics of seams." *PDC'14*. March 06-10, Windhoek, Namibia. ACM. Print.
- Stover, Del. "Students 'Hacking' School Computer Systems." *Education Digest* 71.4 (2005): 54-56. Print.
- Strange, Susan. *Casino Capitalism*. Manchester: Manchester University Press, 1997. Print.
- Taylor, Dorceta E. "Environmental Racism." *Pollution A to Z*. Ed. Richard M. Stapleton Vol. 1 New York: Macmillan Reference USA, 2006. 208-210. Print.
- Tuck, Eve. "Suspending Damage: A Letter to Communities." *Harvard Educational Review* 79.3 (2009): 409-427. Print.
- Twist, Kade L. "Native Networking Trends: Wireless Broadband Networks" *The Digital Beat*, Benton Foundation. 20 Sept. 2001. Web. 3 March 2014.
- U.S. Congress, Office of Technology Assessment, *Telecommunications Technology and Native Americans: Opportunities and Challenges*, OTA-ITC-621. Washington, DC: U.S. Government Printing Office, August 1995. Print.
- "Using technology to preserve tradition." *Char - Koosta News* [Pablo, Montana] 24 Aug 2006. Print.
- Vanderwerth, W.C., and William R. Carmack. *Indian Oratory: Famous Speeches by noted Indian Chieftains*. Oklahoma: University of Oklahoma Press, 1971. Print.

- Varma, Roli. "Attracting Native Americans to Computing." *Communications of the ACM* 52.8 (2009): 137-140. Print.
- "Verizon forced to hand over telephone data – full court ruling." *THEGUARDIAN.com*. The Guardian News, 5 June 2013. Web. 16 Dec. 2014.
- "Video Game Maker Take-Two Reports an Unexpected Profit." *New York Times* 2 September 2010: B2. Print.
- Virilio, Paul. *Speed and Politics*. Trans. Marc Polizzotti. Los Angeles: Semiotext(e), 2006. Print.
- Virilio, Paul. *War and Cinema: The Logistics of Perception*. Trans. Patrick Camiller. London and New York: Verso, 1989. Print.
- Vizenor, Gerald. *Word Arrows: Indians and whites in the new fur trade*. Minneapolis: University of Minnesota Press, 1978. Print.
- Wardrip-Fruin, Noah, and Nick Montfort, eds. *The New Media Reader*. Cambridge & London: The MIT Press, 2003. Print.
- Warren, Samuel, and Louis Brandeis. "The Right to Privacy." *Harvard Law Review* 4.5 (1890). Print.
- Warrior, Robert A. *Tribal secrets: Recovering American Indian intellectual traditions*. Minneapolis: University of Minnesota Press, 1995. Print.
- Weatherford, Elizabeth. "Native visions: the growth of indigenous media." *Aperture* 119 (1990): 58-62. Print.
- Weiner, Allison Hope. "Mel Gibson Apologizes for Tirade After Arrest." *NYTimes.com*. The New York Times, 30 Jul. 2006. Web. 10 February 2014.
- Wilkins, David E. *American Indian Politics and the American Political System*. Lanham: Rowman & Littlefield, 2002. Print.
- Wilkins, David, and K. Tsianina Lomawaima. *Uneven Ground: American Indian Sovereignty and Federal Law*. Norman: University of Oklahoma Press, 2002. Print.
- Williams, Raymond. "The Technology and Society. (1974)" *The New Media Reader*. Eds. Noah Wardrip-Fruin and Nick Montfort. Cambridge, MA: MIT Press, 2003. 289-300. Print.

- Wilson, Pamela, Joanna Hearne, Amalia Córdova, and Sabra Thorner. "Indigenous Media." *Oxford Bibliographies*. Oxford University Press. 2015. Web. 20 January 2015.
- Wilson, Shawn. *Research is Ceremony: Indigenous Research Methods*. Halifax and Winnipeg: Fernwood Publishing, 2008. Print.
- Womack, Craig S. Introduction. *Red on Red: Native American Literary Separatism*. By Womack. Minneapolis: University of Minnesota Press, 1999. 1-23. Print.
- Worked Examples - WEx*. John D. and Catherine T. MacArthur Foundation and the Bill and Melinda Gates Foundation. Web. 9 Oct. 2014.
- Yazzie, Burkhart, B. "What Coyote and Thales Can Teach Us: An Outline of American Indian Epistemology." *American Indian Thought: Philosophical Essays*. Ed. Anne Waters. Malden: Blackwell Publishing, 2004. 15-26. Print.
- Ybarra-Fraustro, Tomás. "The Chicano Movement/ The Movement of Chicano Art." *Exhibiting Cultures*. Ed. Ivan Karp and Steven D. Lavine. Washington: Smithsonian Institution Press, 1991. 128-150. Print.
- Zetter, Kim. *Countdown to Zero Day: Stuxnet and the Launch of the World's First Digital Weapon*. New York: Random House, 2014. Print.

APPENDIX A

NATIVE STUDIES TEACHER POST-INTERVIEW PROTOCOL

1. How would you describe your Native Studies classes to someone outside of your profession?
2. What is the basic knowledge that you hope your students will leave with after completing your courses?
 - a. What are the basic themes that you cover in your Native Studies courses?
3. Does technology normally play a role in how you teach Native Studies?
4. Has your perspective about technology been influenced by our e-Textiles workshop?
5. How do you feel about how the e-Textiles workshop unfolded in your class?
 - a. What surprised you about how the process unfolded?
 - b. What do you feel you got out of the workshop?
 - c. What do you think students got out of the workshop?
6. As you reflect back, what do you think were some key learning moments for students?
 - a. Given that we are going to repeat the workshop, what do you think worked well?
What would you change or how would you improve it?
7. One of the things we thought worked well was the presentation we gave at the end of class. What were your thoughts on this presentation?
8. After participating in the e-textiles workshop, how do you see the relationship between Native Studies and e-textiles?
9. What do you think we can do differently in a new workshop to improve the connections between e-textiles and Native Studies?
10. What are your hopes for the upcoming workshop?

11. How do you think indigenous identities are complicated when they use electronic technology?
12. In a Native Studies class, how would you connect traditional Native American concepts to a contemporary Native American entrepreneurial practice like the Indian Gaming Casino?
13. What role do you see electronic technologies playing in Native American self-determination?
14. How do you think about borders within the context of Native Studies? By borders we are referring to indigenous peoples living on both sides of the border, a border that complicates ideas of rural and urban environments, the traditional bordering on the contemporary, etc.

APPENDIX B
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