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Ecomedia Literacy: Educating with Ecomedia Objects and the Ecomediasphere

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ECOMEDIA LITERACY: EDUCATING WITH ECOMEDIA OBJECTS AND THE ECOMEDIASPHERE

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Abstract: *Ecomedia literacy cultivates the exploration of ecomedia objects-- media texts (advertisements, news articles, television commercials, websites, films, etc.), platforms (streaming services, social networks, media organizations), gadgets (smart phones, tablets, computers, etc.), or hyperobjects (anamorphous disbursed phenomena that behaves like a system, such as the internet, fake news, or media industry). In this paper, I introduce an integrative method of analysis I devised called the "ecomediasphere." The ecomediasphere prompts learners to explore the ecomedia object's use and meaning from four different perspectives: lifeworld, culture, political economy, and materiality. Conceptually and theoretically, these four perspectives correspond with various lenses that inform digital media literacy and environmental literacy.*

Introduction

If scientists are telling us we have less than a dozen years to decarbonize our economy or face catastrophic climate impacts (Tollefson, 2018), what should we prioritize as media educators in order to achieve an environmentally just, carbon neutral, ecologically healthy ecomediasystem? An ecologically normative framework demands a system-wide appraisal by digital media educators of this threat, necessitating that we expand our methodology and curriculum design to incorporate practical methods and solutions for integrating environmental awareness into our pedagogy. This means bridging environmental literacy with media education, but also encouraging productive methods of eco-citizenship, because the climate emergency is both a cultural and political crisis. It's an extension of personal ethical concerns to the public sphere (and vice versa), calling for collective action and policies (Curry, 2011; Maxwell & Miller, 2008). To support these efforts, I have been designing a method of ecomedia literacy—the integration of media literacy with environmental literacy—in order to insert an ecological perspective into digital media education (López, 2014, 2015a, 2015b, 2019).

My vision for ecomedia literacy requires fundamentally redesigning how we conceive and teach media. It starts with incorporating systems design thinking, a practice (like critical thinking) that is often bundled with digital literacy and media literacy as a necessary 21st century skill (Jacobs, 2010). Sterling (2004, p. 11) asserts that environmental education is to foster *whole systems thinking*. One of the pioneering public intellectuals of the 20th century that advocated systems dynamics, Donella Meadows, wrote extensively about the relationship between media and systems thought. System dynamics, she wrote, "makes clear the overarching power of deep, socially shared ideas about the nature of the world. Out of those ideas arise our systems—government systems, economic systems, technical systems, family systems, environmental systems" (Meadows, 1991, p. 2).

A good way to visualize this is the iceberg model of systems thinking, which treats ecological problems as design challenges rooted in mental models. This approach posits that systemic problems are unsolvable if we only react to events without examining how they are caused by underlying patterns (trends over time), systemic structures (policies, laws, infrastructure, how parts connect), and mental models (assumptions, beliefs, attitudes). For example, the proverbial tip of the iceberg is the visible and immediate event, such as ecological disasters like forest fires, hurricanes, or oil spills. Normally they are treated as momentary catastrophic events in which the damage is repaired but business as usual continues without solving the underlying problem that caused the event to occur, such as rebuilding structures on coasts damaged by hurricanes (despite predicted rising seas and future catastrophic weather) or developing properties in dangerous fire zones. A systems dynamics approach attempts to solve the core pattern that caused these events by exploring beneath the surface of the tangible event, such as reducing or eliminating fossil fuel emissions that trigger extreme weather events. It is at the deepest level, worldview, where solutions grow, leading to the design of new systems to address the predicament.

To use a digital culture example, we can apply the iceberg model to the problem of fake news, but from an ecomedia perspective. Conventional media or information literacy tends to focus on deconstructing media "events" that are expressed in the form of texts, such as specific instances of fake news. Here I want to focus on what I call "fake climate news," which is deliberate climate disinformation and propaganda designed to reinforce right-wing ideology about the market economy and to create confusion about climate science to prevent industry regulation (López & Share, 2020). Just beneath the surface, the analysis will identify patterns over time, such as how fake climate news exists as part of a range of texts distributed throughout social media and the news ecosystem, but also distinguishes what is novel about it. A deeper enquiry, like the kind performed by critical media literacy, delves into systemic structures that interact with and influence the media text. This means exploring cultural norms, the political economy of digital media platforms and legacy news media, and analyzing hegemonic global capitalist institutions that inform how and why particular patterns of news, propaganda, and disinformation emerge over time. This includes a discussion of the economic status quo that enables a feedback loop between fake climate news, platforms that afford addictive software design and clickbait, and digital media infrastructure that exacerbates the climate crisis. At the deepest level of analysis is the anthropocentric worldview and ideology that drives the whole system and determines its goals. Fake climate news is merely a symptom of a much larger structure.

In this paper I introduce a heuristic I have developed called the *ecomediasphere*, an integrative method of analysis that draws on systems thinking.[1] It enables students to explore different facets of ecomedia objects (media texts, platforms, gadgets, and ICT systems) in order to get students to drill down to the level of worldview. The ecomediasphere prompts learners to explore ecomedia objects from four different perspectives: lifeworld, culture, political economy, and materiality. I situate this methodology within the context of research I performed about gaps in media literacy practice and environmental issues (López, 2014). As opposed to functionalist competency models, I assert that digital media education should interpolate eco-ethics and civic responsibility. Unfortunately, historically media

education has marginalized and eschewed the environmental dimensions of media and ICTs. In response, ecomedia literacy incorporates active eco-citizenship, which means embodying sustainable behaviors and cultural practices that shape and promote ecological values within the interconnected realms of society, economy, and environment. Ecomedia literacy supports learners to make sense of how everyday ecomedia practice impacts our ability to live sustainably within earth's ecological parameters for the present and future. In doing so, it promotes the understanding that media need to be integrated as a socio-technological ecosystem embedded within the web of life.[2]

Media Literacy and the Environment

Until recently there has been a dearth of media literacy research and materials that incorporate an environmental perspective.[3] My book, *Greening Media Education* (López, 2014), presents extensive research (qualitative and ethnographic) of North American media literacy practices and practitioners that I performed to explore the barriers and opportunities for incorporating ecology into media education. I conclude that mainstream media literacy practices are primarily based on a 19th century mechanistic paradigm of communication and education, reinforcing the belief in technological progress at the core of modernity. This strengthens a Cartesian view of the world that frames humans as separate and distinct from the more-than-human world [4] and reinforces anthropocentrism (human-centeredness), which is driving our global environmental crisis. Likewise, this leads to an analytical method that approaches the political economy of ICTs without regard to concern for the environment or labor practices. In terms of the day-to-day struggles of educators, the lack of environmental approaches is also a response to current educational conditions in which teachers are discouraged to engage "controversial" politics and are increasingly required to fit their curriculum into mainstream education standards (such as emphasizing STEM over humanities and the arts). As such, "Current pressures for standardization, privatization, and high stakes testing are driving public education to focus more on global competition than on democratic ideals and social justice" (Kellner & Share, 2019, p. 13). In terms of ecomedia literacy, my study also shows that many important modes of inquiry are excluded, including the study of affect, medium, environmental political economy, systems thinking, ecology, and alternative media.

Budget cuts and lack of professional development are other external stresses that constrain and limit how media are taught. The demand for media literacy ebbs and flows within policy debates about media panics (fake news, video game violence, pornography, cyberbullying, etc.) and tends to be promoted by bodies associated with regulating media industries rather than being integrated into education policy. And as Kellner and Share (2019, p. 1) assert, "intense pressure for change comes more often from technology and the economy and less frequently from education reform." Some have argued that the term "media literacy" is redundant and should be considered part of a larger "literacy" that promotes cultural capital, i.e. the ability to participate in culture, politics, and economy (see Tyner, 1998). Buckingham (2019, p. 110) argues, "If [students] are going to become active and powerful users of technology, they need more than technical skills: they need social, political, economic and cultural understanding." I'm sympathetic with this expansive view of literacy, with the caveat that the notion

of participation is not limited to one of consumerism (as promoted by neoliberal discourses around education reforms) or mere technical competence, and that it integrates the notion of eco-citizenship.

Ecomedia's Ecological Footprint

Until recently we didn't have a common vocabulary to describe the intersection between digital media and the environment. In an earlier crude attempt, I used "mediacology" (López, 2008) to avoid confusion related to the use of environmental metaphors to describe media, such as "media ecology," which is associated with medium studies but excludes the more-than-human world. Now media scholars are settling on a term that is more precise and to the point: "ecomedia," a "historically situated, ideologically motivated, and ethically informed approach to the intersections of media, society, *and* the environment" (Rust, 2016, p. 87 emphasis original). Renaming media as ecomedia addresses the opacity of media's ecological character (in the sense of unseen, unrecognized, ephemeral, hiding in plain sight, and taken-for-granted). As it tautologically suggests, ecomedia reframes media as ecological media; that is, media are a material reality that are in, and a part of, our environment in the broadest sense(s). Because there are no media that are inseparable from their material conditions and the environment that produced them, all media are ecomedia.

To differentiate from the historical and situated uses of media ecosystem and media ecology, I use *ecomediasystem* to mark an inherent eco-ethical orientation that differentiates from previous conceptions of media ecosystem.[5] Here I define ecomediasystem as the eco-ethical relationship between the ecomedia environment and its members (human and more-than-human). Drawing from what we know about semiotics—that cultural codes are not fixed, and therefore not finally fixed (see Hall et al., 2013)—ecomedia literacy can repurpose the media ecosystem metaphor to incorporate eco-ethics and linguistic conventions to change meaning over time. Given the complex impacts of ecomedia, an ecomedia literacy program requires a holistic method of analysis that enables students to explore the various ecological dimensions of ICTs as operating within the ecomediasystem. Grounded in eco-citizenship the aim of ecomedia literacy is to clarify and amplify how the ecomediasystem is not natural but is the result of deliberate choices and shared values.

The Ecomedia Footprint

A holistic digital media analysis starts with an overview of the cyclical ways ICTs change the environment, its users, and the feedback system that impacts ICTs. The material impact of media on the environment can be traced all along the production chain of our technological gadgets, which disproportionately and negatively impacts the Two Thirds World[6]; they entail inputs from the Earth (mining, logging, drilling) and outputs into the Earth (air, land, water) (Cubitt, 2017; Maxwell et al., 2015; Maxwell & Miller, 2012; Parks & Starosielski, 2015; Walker & Starosielski, 2016). The ICT system is driven by consumerism predicated on an "invisible" infrastructure and supply chain based on a "multiscalar resource economy of extraction, production, distribution, consumption, representation, wastage and repurposing" (Walker and Starosielski, 2016, p. 1). And as Parikka (2015)

asserts, minerals from the Earth are integrated into our gadgets and batteries, making the planet's geology a necessary part of any medium. In sum, our devices leave an ecological bootprint through their manufacture, use, and disposal, while all the data our gadgets access and store in the "cloud" also physically pollute the environment. Emerging technological trends, such as cryptocurrency mining, AI training, and the internet of things are set to increase environmental impacts through increased energy consumption, industrialization, and e-waste (Tarnoff, 2019). Additionally, what is perhaps the most taboo subject of all is the impact of wi-fi and cellphone microwaves on our electromagnetic environment and physical health (Maxwell & Miller, 2020; Singer, 2014).

The transition to a digital economy has not reduced the materiality of media. The legacy media business model was based on selling material objects, what Lessig (2008) refers to as the read-only media economy: newspapers, CDs, records, DVDs, etc. Even though the digital economy disrupted this model to migrate most content to online services, the industry still requires physical objects (screen-based gadgets) and an infrastructure to stream data (music, TV, film, books, etc.). As global visual culture becomes an indispensable aspect of our lives (see Mirzoeff, 2016), we are increasingly a screen culture that demands convenience (Lewis, 2013). The consequence is that many of us in rich countries have multiple devices to do the same things—such as PCs at home and work, laptops, phones, tablets, and legacy electronics (TV, radio, etc.)—predicated on built-in obsolescence and an economic model of unlimited growth. These devices are a digital smorgasbord of components, some of which require renewing (like rechargeable batteries), some of which may be regularly or occasionally upgraded (such as processors), and some relatively stable components (such as sound and image reproduction). But they increasingly come in a sealed container, so that, constrained by the inflexibility of its packaging, it will last only as long as its least durable component. (Lewis, 2017, p. 60). So, though our content is increasingly digital, it is far from immaterial. As remarked by Chinese researcher Jack Linchuan Qiu (2016, p. 13), "To make these tangible products, there has to be a global system to assemble, polish, pack, and transport them before they can be used to relieve, generate, and circulate content, and to facilitate social networking. Digitization has, in this sense, made the world more industrial and more dependent on the geopolitics of industrialism, not less."

The ecomedia mindprint

Digital media's *mindprint* is the way that communication influences how we define, act upon, and live within living systems, what Corbett (2006) calls environmental ideology. How media shape and define our experience of the world is multifaceted. In terms of their negative environmental impacts, media propagate an ideology of unlimited growth and consumerism. This includes convincing us that it's perfectly normal to design gadgets that can't be upgraded or repaired so that we have to continuously update (and discard) outdated gadgets in order to participate in the economy and society. Advertising and popular culture also reinforce the belief that Nature is separate from humans by obscuring the environmental impacts and interconnections of our gadget use and the global ecological system. The news media often marginalize alternative ecological perspectives in discourses about sustainability, while tech industry discourses greenwash the environmental impacts. As discussed about fake climate

news, platform capitalism's business model affords rightwing and nationalist politics, which undermines environmental action and drives disinformation about the climate. And as Louv (2005) asserts, digital media impact our experience of time, place, and space to produce a kind of "nature deficit disorder." Whether there is direct correlation or not, the rise of the internet and social media parallels the exponential increase of carbon emissions in the atmosphere, possibly because the internet is an integral aspect of expanding and running the neoliberal global system.

But it's important to also acknowledge the importance of social media platforms to promote awareness of environmental issues and science, and to help coordinate action, as has been the case of the Dakota Access pipeline struggle in North Dakota in 2016 (and other indigenous environmental battles), raising awareness about Amazon forest's destruction, or propelling the #FridaysForFuture campaign driven by youth activists. We can add to this ready access to numerous online documentaries, scientific reports, and news sources that raise awareness about fracking, water scarcity, biodiversity loss, extinction, and so on. So, while the material and ideological impacts of digital media are major contributors to the global climate crisis, digital media also afford access to information, produce the network effect of spreading and sharing information, and can amplify solidarity and empathy for environmental change. Clearly digital media is a necessary tool for how we solve ecological problems.

Combining ecological footprint and mindprint, ecocinema scholar Nadia Bozak (2011) uses the term, "resource images," which posits that media texts are symbolic and discursive resources, but also are in and of themselves ecological resources. For example, iconic images of burning oil refineries from the 1991 Gulf War communicate about human domination/destruction of the environment and the ideology of oil dependence and war. But in order to create, view, and retrieve those images we require a supply chain that makes image technology possible, technological infrastructure, and material containing the image itself (newspapers, TVs, computers, screens, etc.). This includes the fact that images are data files that exist on servers, whose storage and use produces CO_2. Like gas, water, and electricity, we take for granted how these resource images are likewise piped into our homes. Bozak asks, what would happen if an end of oil affects "not only the functioning of society and culture at large, and on a global level, but also, as a consequence, the way moving images are produced and received?" (p. 2)

Crucial to an ecomedia reboot for digital media literacy is combining the material and affective turns in media studies with the ecocritical and postcolonial critique in humanities. It also means expanding ethics to our extended biotic communities and an awareness of how environmental ideologies permeate our worldview. As proposed by ecocriticism and environmental humanities, this involves acknowledging the legacy of Western epistemology and colonialism in how the concept of Nature and other binaries has led to a dividing off of the web of life from studying media. Additionally, I believe that when examining the political economy of media we should integrate the world-ecology analysis of capitalism, which ties together ecological footprint and mindprint by arguing that capitalism doesn't act on Nature, but is an ecology itself (see Moore, 2015). All of this is conceptualized within the iceberg model of systems thinking in which the ecomedia object is the visible and physical manifestation of

deeper patterns and ultimately a worldview that drives how we design ecomediasystems. The aim, then, is to devise a methodology that allows for deeper, holistic explorations of digital media that go beyond instrumental, superficial, or incomplete analysis that eschews or ignores ecological concerns.

In sum, ecomedia literacy has the following learning objectives, with Bloom's Taxonomy (Bloom & Anderson, 2014) in parenthesis:

- To interpret (comprehend) how media are materially interconnected with living systems by how they affect biodiversity loss, water and soil contamination, climate change, and the health of workers;
- To research (analyze) how ICTs are interdependent with the global economy and development models, and how the current model of globalization correlates with the history of colonialism and its impacts on livings systems and ecojustice;
- To distinguish (analyze) how media form symbolic associations and discourses that promote environmental ideologies and ethics;
- To assess (evaluate) media's phenomenological influence (affect) on the perception of time, space, and place; and
- To apply (application) emerging and alternative uses of media that promote eco-ethics and eco-citizenship.
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Ecomedia literacy incorporates environmental themes and concepts to encourage eco-ethical cultural behaviors and attitudes by extending the concept of ethics and civic responsibility beyond an anthropocentric gaze to extend empathy and care to the living planet.

The Ecomediasphere

Students can engage in holistic ecomedia analysis using a heuristic I developed called the *ecomediasphere*, an analytical tool that enables the exploration of the symbolic, material, phenomenological, and ideological character of ecomedia objects. An ecomedia object is a boundary object: something that has commonly agreed upon characteristics but its meaning and function changes according to context; it retains the original meaning of media as something that is "in-between." For example, a smartphone will have different purposes according to designers, manufacturers, users, app developers, workers, and users. An ecomedia object can be anything media related, scaling from micro (text/gadget) to macro (ICT systems, hyperobjects). I propose that the unit of analysis should be one of four categories: 1) representational media text (advertisement, news article, film, TV commercial, website, food packaging, etc.); 2) platform (streaming service, social network, or media organization); 3) gadget (smart phone, tablet, computer, etc.); or 4) hyperobject (an amorphous disbursed phenomena that behaves like a system, such as the internet, fake news, or media industry). Ecomedia objects simultaneously represent something specific but exist as situated within a broader system of meaning and material conditions. It's not just what media objects are, but what they do. Ecomedia objects in

the first category (representational media texts) that deal specifically with ecological issues have the duel condition of being "images of ecology" while also being part of an "ecology of images," i.e. an ecology of meaning systems (Ross, 1994). Additionally, ecomedia objects are always embedded in social practice, and therefore should not be viewed in isolation of the context or platform that mediates them. As Buckingham (2019, p. 78, emphasis original) asserts, "the advent of social media suggests that we might need to displace the text from its central, privileged position, or at least do more to set the text in its wider social context. Our focus should not be so much on *media texts* as a set of self-contained objects, but rather on their processes of *mediation*."

Though not centered on ecological issues per se, cultural studies' model of analysis, the circuit of culture, inspires the design of the ecomediasphere. It goes beyond focusing on the media text by exploring the iterative relationship between media objects and production processes as they move through particular dialectical "moments," where meaning is produced at different sites of practice. As formulated in a study of the Walkman and later revised with the iPod (Du Gay et al., 1997, 2013), the circuit consists of a feedback system between the representation, identity, production, consumption, and regulation of media objects. Missing from their approach, and hence the necessity of an "eco" turn, is the analysis of ecomedia objects from ecocritical, affective, and material perspectives. Adrian Ivakhiv (2013), whose object-oriented approach to ecocinema analysis has parallels to my own approach, asserts the importance of the circuit of culture by attesting that, "At each moment, the object is connected to a larger social and technological world: its production, transmission, and reception are enabled and contained by available media and production networks, financial capital, and audience mobilization mechanisms, as well as by available cultural discourses, hopes and expectations shaped by recent successes in the media, and so on" (p. 37). The multidimensional approach of the ecomediasphere also draws on Guattari's (2008) three ecologies (social, mental, and material).

Using the ecomediasphere as an orientation device, the ecomedia object is explored from four different "scapes"[7]: lifeworld, culture, political economy, and materiality (see Figure 1). This allows students to examine how the ecomedia object impacts our sense of time, place, and space (lifeworld); cultural meaning and significance (culture); how it is produced and functions within the broader global economic system (political economy); and the significance of its material properties and their impact on the environment (materiality). Ultimately, when probing an ecomedia object we are asking, how is the world in *it*? How is *it* in the world? And, where does *it* come from? (see Dumit, 2014) What follows is a very brief summary of each scape.
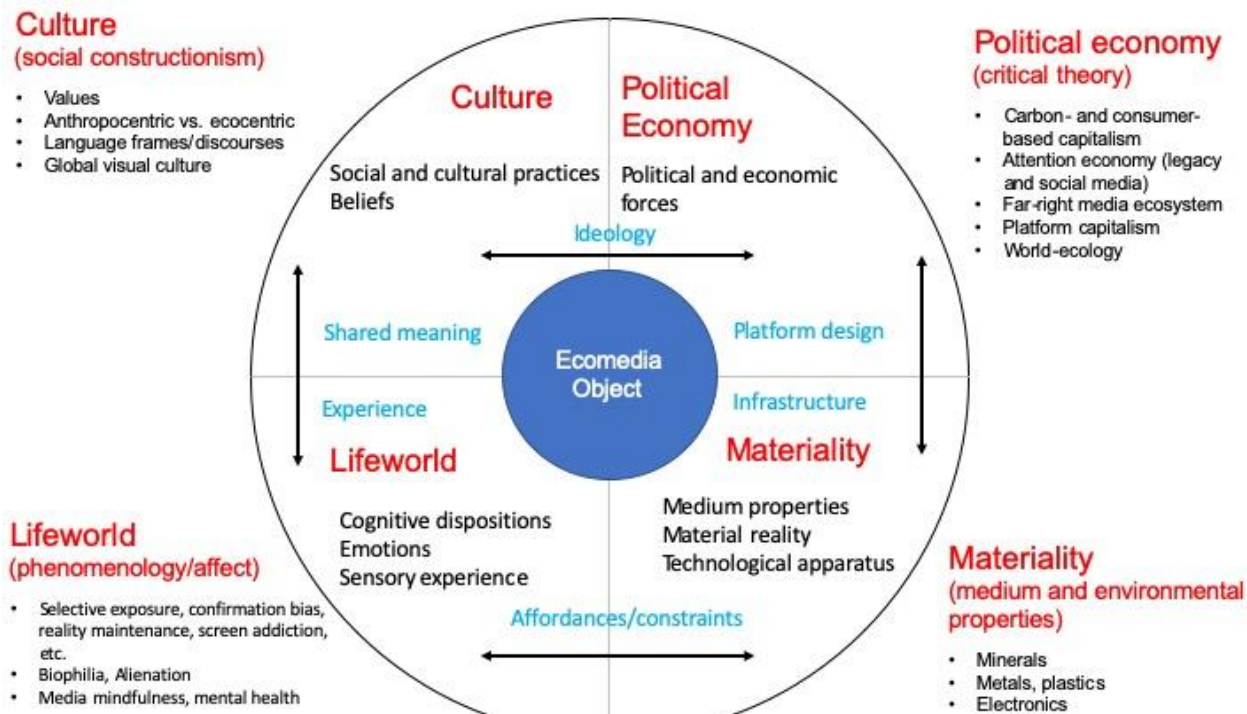
Fig. 1: The Ecomediasphere

Lifeworld (phenomenology) corresponds with the ecology of perception (how environments afford and constrain our cognition) and correlates with the affective turn in media studies (sensory and emotional experience of media). In simplistic terms, lifeworld relates to the individual's cognitive experience of time, space, and place. Environmental educators advocate for learners to develop a sense of place in order to care for the living systems that they depend on and to become conscious of their living habitats. Learners can engage a number of exercises to become aware of how media impact their experience of space, place, and time by keeping media usage diaries, doing media fasts, and making comparative analysis by experiencing places with and without media. For example, a learner can compare the experience of walking through a neighborhood or forest with no media device with the experience of doing the same route through the view of a video camera or smart phone. This is mindfully approached by acknowledging that media are no longer "out there" (i.e. somewhere we go to), but something that we (while possessing our gadgets) are always in and a part of. Students can engage how media impact a variety of emotional responses and phenomena, such as alienation, biophilia (love of nature), biophobia (fear of nature), sense of place, sublime, technology addiction, disrupted natural biophysical rhythm (electromagnetic disruption), and mental health. Students can investigate how sound, color, shape, form, and light are in fact nervous system stimuli and can be understood as physiological phenomena. This approach can broadly be defined as cultivating "media mindfulness," which is the ability to be conscious of how we cognitively interact with media.

Culture (social constructionism) is meaning, values, way of life, and practices through shared interpretations and "making sense." From the standpoint of systems of representation, it is examined by exploring languages, discourses, and semiotics. It is the locus of more classical activities of textual

analysis associated with media literacy and media studies. Learners identify environmental ideologies (beliefs about how humans should act upon and live within the environment) in media texts, but also develop information literacy skills to verify environmental claims. In addition, learners can map cultural behaviors and attitudes through social media to identify how belief systems are shared and spread. Intercultural dialog can be used to explore the relationship between different cultural perspectives concerning the use of technology and media in connection to diverse ecological values and the environment, especially in the context of global visual culture. As noted by Mirzoeff (2016, p. 11), "A visual culture is the relation between what is visible and the names that we give to what is seen. It also involves what is invisible or kept out of sight." Because meanings aren't fixed, culture can change over time and can be infused with new practices and forms of eco-citizenship.

Political economy (critical theory) characterizes the economic, political, and social system driving digital media and processes of encoding (fixing cultural codes). An ecomedia perspective inherently demands a critical approach that is grounded in the tradition of critical political economy, most notably associated with neo-Marxist perspectives. As defined by Wasko (2014, p. 258), the primary concern of critical political economists is with the allocation of resources within capitalist societies. Through studies of ownership and control, political economists document and analyse relations of power, class systems and other structural inequalities. Critical political economists analyse contradictions and suggest strategies for resistance and intervention using methods drawn from history, economics, sociology and political science.

In terms of digital media culture, I combine the critique of platform capitalism (Christl & Spiekermann, 2016; Fuchs, 2017; Zuboff, 2019) with the work of the world-ecology research network (https://worldecologynetwork.wordpress.com/), especially the research of Jason W. Moore (2015, 2016; Patel & Moore, 2018). For the ecomediasphere analysis, students examine the ideological structure of the global economic system as it relates to media and gadget production. This necessitates research into global ICT infrastructure and production, which invariably drives the material characteristics of ecomedia objects (see Cubitt, 2017). This also involves a kind of technoliteracy that critically engages the economic motives for technological systems and commercial practices, such as surveillance and data gathering, advertising, promoting and marketing, datamining and analysis, and the selling of data (see Buckingham, 2019, p. 79). The aim of ecomediasphere's integrative approach is to soften the more deterministic tendencies of critical political economy analysis to be more balanced in the tradition of cultural studies.

Materiality (medium and environmental properties) is the objective material conditions of a particular object of analysis. It is also where the technological apparatus in its literal form is explored. This scape incorporates the perspective of the material turn in media studies and humanities (Bollmer, 2019; Herzogenrath, 2017). From an ecomedia standpoint, this part of the analysis identifies the material aspects of media, such as semiconductor production, cables and pipelines, cell towers and electromagnetic radiation, extraction, production, e-waste, energy and emissions, and medium

properties. Activities include environmental audits, which track and measure the ecological footprint of media.

In keeping with the ecological principle that everything is connected to everything else, ecomedia objects are intertextual/intermedial, meaning that they connect and refer to other elements outside of themselves, such as genre, discursive conventions, discursive communities, cultural codes, productions systems, etc. No ecomedia object can be fully understood outside the cultural and political economic context it emerges from.

It should also be explored from perspectives of those traditionally disenfranchised from the power structure. Drawing insight from feminist standpoint theory (see Kellner & Share, 2019, p. 24), which situates knowledge and experience from the perspective of women or marginalized populations, the ecomediasphere can enable students to study the ecomedia object from different points of view and to explore power relations. For example, what if students examined their personal gadget from the perspectives of a Congolese child laborer extracting rare earth minerals, Chinese FoxConn assembler, "playbour" gamer, Amazon warehouse worker, or big box store sales associate? These explorations can then be communicated using M.C. Bateson's (2007) education for global responsibility model, which calls for creating narratives of connection with digital storytelling tools (video essays, curated blogs, Prezi, etc.); translating concepts between media and ecology disciplines using ecological metaphors to describe media phenomena; performing crossovers with ways of knowing through participant observation and social learning (students working in groups or performing ethnography); and developing an ethical framework in order act upon these understandings and to make wise choices.

Teaching with the Ecomediasphere

I've been teaching media and the environment to undergrads for more than a dozen years and my application of the ecomediasphere remains a work in progress. Based on experience and anecdotal evidence, this section offers some advice for how to approach ecomedia literacy. The curriculum model I use is based on the backwards design method that works towards a solution based on a rationale (how the curriculum unit prepares students to engage in digital media eco-citizenship), essential question (a compelling question that focuses teaching and drives inquiry and learning), outcomes (what students should understand, know, and be able to do), and assessment (evidence used to demonstrate student learning) (Cloud Institute for Sustainable Education, 2011, pp. 60–61). For example, learners can be charged with the following query: What constitutes a healthy ecomediasystem? Or, what form does sustainable ecomedia take? The ecomediasphere then becomes a design tool to help guide students towards answering these larger questions. It can be incorporated into curriculum in different ways, such as:

- Structure the class by dividing the semester into the four scapes, or choose one ecomedia object as the focus of the entire course, dividing the schedule into the four scapes;
- Have students perform an analysis of an ecomedia object as a specific assignment (choosing from the categories of text, gadget, platform, or hyperobject);

- Assign students to investigate a personal gadget according to the four scapes;
- Start from different quadrants and go in different directions (clockwise or counterclockwise). Does that change the nature of the analysis?
- Treat a tech or media company as an ecomedia object and critically evaluate its sustainability claims.
- Be creative and design your own assignment and approach.

Students can report their research and analysis as a paper, video essay, multimedia presentation, infographic, oral presentation, podcast, curated online exhibit, blog, etc. My experience is that systems approaches are best simplified through visual forms of communication.

Researcher and activist Katie Singer has developed a model of eco-citizenship that can be replicated and incorporated into an ecomediasphere analysis. In her "Campaign to Reduce Our Internet Footprint" (Singer, n.d.), she offers the following steps as research prompts (visit https://www.ourwebofinconvenienttruths.com/campaign for more detailed instructions): 1) Get informed about the true costs of using a smartphone, including sending text messages or streaming video; 2) Pick one element in a smartphone and research it, such as screen, battery, case, and electronics (i.e. the circuit board, wiring, speakers, and motors); 3) Research the ore or chemicals in the phone; 4) Research the infrastructure that smartphones require; 5) Reduce your Internet footprint by 3% per month and get your school, workplace and household to join you; 6) Share your findings with classmates, neighbors, co-workers; and 7) Insist that manufacturers prioritize safer chemicals, less extractivism, and worker protections over profit. This assignment can be supplemented with Maxwell and Miller's (2020) book, *How Green is Your Smartphone?*, which goes through in detail the environmental impacts of mobile devices and urges readers to learn how to "outsmart" their smartphones.

I'm still prototyping the ecomediasphere (I have also not settled on what to call it). I have used the ecomediasphere as curriculum design guide (dividing my undergraduate Media and the Environment course into the four scapes) and as an assignment to perform a specific analysis of an ecomedia object. The assignment is given towards the end of the semester after students have already learned about the core issues of ecomedia studies and have gained competencies (through other assignments) in doing discourse and semiotic analysis, and ecocriticism. Through a combination of lectures and readings, they also have encountered an overview of how the global economic system works. I give them ample resources for research (I have a class website that links to multiple organizations and databases that focus on technology and the environment), but I also push them to develop their own research skills by utilizing the library and databases. Obviously, the analysis will vary depending on type of media object (i.e. text, platform, gadget, or hyperobject). Importantly, students learn better and retain concepts when they can relate the information they are learning to their personal lives.

I am aware that this kind of analysis can be overly complex. Some of the vocabulary is new and difficult to understand for students who are not accustomed to systems thinking. Unlearning that habit of constant reduction is difficult. I have toyed with choosing terms like "ecoculture" for culture and

"eco/nomy" for political economy, but my experience is that you need to have some familiar terms to get students to relate to the model. As Buckingham asserts, best practice means: 1) start with what students already know (existing knowledge and direct experience) by surveying and documenting their own media usage; and 2) combine theory and practice. Media analysis should be an open-ended process that allows students to develop different interpretations.

I have only utilized the ecomediasphere during the course of a 15-week semester. I have yet to apply it with younger students (K-12) or as a single lesson. But as a semester-long process, I feel that it has worked quite well. Two issues that have come up include students confusing ecocentricism with being anti-human (it is the opposite of anthropocentricism, but it just means placing humans as equal to the more-than-human world) and becoming destabilized because the ecomedia critique undermines the status quo. Many of my former students have gone onto become very strong environmental activists, something they did not envision before taking my class, so I feel like that is in itself a sign of success.

Conclusion

To close, I offer a simple manifesto in the form of a poem/prayer from Taiwan Digital Minister, Audrey Tang (2016). Serving as an alternative to the instrumentalist approach that pervades much neoliberal tech and education, this can easily be expanded as core guiding principles for an ecomedia literacy platform. In Tang's words,

> When we see "Internet of Things," let's make it an Internet of Beings.
> When we see "Virtual Reality," let's make it a Shared Reality.
> When we see "Machine Learning," let's make it Collaborative Learning.
> When we see "User Experience," let's make it about Human Experience.
> When we hear "the Singularity is Near," let us remember: the Plurality is here.

It is in the spirit of this mini-manifesto that ecomedia literacy seeks to reframe digital media education, for when we see media, let's make it ecomedia. And when we see digital media literacy, let's make digital ecomedia literacy.

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[1] This article is a brief summary of concepts being developed for a book I'm writing, *Ecomedia Literacy*, that will be published by Routledge in 2020.

[2] Instead of web of life, Morton (2009) prefers the term "mesh" to include artificial and human built elements.

[3] In an effort to develop the field, in 2020 I co-edited (with Jeff Share and Theresa Redmond) a special co-published issue of the *Journal of Sustainability Education* (http://susted.com/) and the *Journal of Media Literacy* (https://www.journalofmedialiteracy.org/) dedicated to ecomedia literacy.

[4] More-than-human world was coined by David Abram (1996) as a way to differentiate between humans and Nature without reinforcing the binary between them. It has been widely adapted by eco-philosophy, environmental humanitiex, ecolinguistics, and ecocriticism.

[5] For a history of how the term media ecosystem is used, see Nadler (2018).

[6] Esteva and Prakash (1998) use Two Thirds World as an alternative to "third world" and "developing world" to indicate that underserved and impoverished regions of the world are the global majority. Alternately, we could refer to it as the walled and un-walled world to reflect the border fortress surrounding rich nations.

[7] The term scape signals the idea that these are conceptual "landscapes" of the ecomediasphere. It borrows from Ingold's (2011) important exploration of landscape phenomenology, which deals with how humans perceive and experience their surroundings in the lifeworld (or what is called in German, *umwelt*). I also use scape as a homage to Appadurai's (1996) use of the term to describe different dispositions in the global culture, the idea being there are layered and diverse ways of orienting oneself within the ecomediasphere.