

Disinformation detox: teaching and learning about mis- and disinformation using socio-technical systems research perspectives

Teaching and
learning

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Abstract

Purpose – This paper aims to address some limitations in existing approaches to the study of mis- and disinformation and offers what the authors propose as a more comprehensive approach to framing and studying these issues, geared toward the undergraduate level of learner. In doing so, the authors prioritize social shaping of technology and critical informatics perspectives as lenses for explicating and understanding complex mis- and dis-information phenomena. One purpose is to offer readers an understanding of the mis- and dis-information studies landscape, and advocate for the merit of taking the given approach the authors outline.

Design/methodology/approach – The paper builds upon design-based research (DBR) methods. In this paper, the authors present the actual curriculum that will be empirically researched in 2022 and beyond in a program of iterative DBR.

Findings – Findings of this conceptual paper comprise a fully articulated undergraduate syllabus for a course the authors entitled, “Disinformation Detox.” The authors will iterate upon this curriculum development in ongoing situated studies conducted in undergraduate classrooms.

Originality/value – The value and originality of this article is in its contribution of the ontological “innovation” of a way of framing the mis- and dis-information knowledge domain in terms of social shaping and critical informatics theories. The authors argue that the proposed approach offers students the opportunity to cultivate a complex form of what Milner and Phillips describe as “ecological literacy” that is in keeping with the mis- and dis-information problem domain.

Keywords Information literacy, Misinformation, Media literacy, Critical informatics, Ecological literacy, Social shaping of technology, Syllabus design

Paper type Conceptual paper

1. Introduction

Misinformation studies is a growing research domain within and across scholarly disciplines, such as Political Science, Journalism and Media Studies, Information Studies, Communications and Digital Humanities. Definitions and approaches to the study of misinformation vary widely across disciplines, and the ways in which scholars in a given field are teaching about misinformation often reflects how the phenomenon is being conceptualized and theorized in that discipline’s literatures. Many frameworks and



definitions of mis/disinformation exist. The call of this special issue acknowledges these variations, as it solicits work that moves beyond focusing on partisan arguments about false and misleading information toward pedagogically-framed work that explores how educators can engage their students and the public in more nuanced discussions around information in many mediated and socio-technical contexts.

In contrast to approaches responsive to socio-technical systems research paradigms, educators often instead frame mis- and dis-information in media and information literacy terms, suggesting individual literacies as solutions (Boyd, 2018a, 2018b; Bulger and Davison, 2018). Other research scholars address mis- and dis-information from their particular scholarly lenses, investigating and analyzing phenomena from more systemic angles, often placing emphasis on one or two primary loci for solutions-oriented change, for instance, human-computer interaction (HCI) scholarly perspective, which narrows in upon technical interventions, such as changing the technical capacities of socio-technical systems act as the primary levers of activist impact.

Further, the phenomenon of mis- and dis-information has taken on a variety of framings in public discourse. News outlets discuss the problem as “taking us back to the oral tradition of pre-literacy days” (Martínez, 2018), “causing a kind of fun-house effect that leaves the reader doubting everything, including real news” (Tavernise, 2016) and promising to become more widespread with the advent of artificial intelligence (AI) that not only spreads false information but also can be used to generate it (DiResta, 2020; Foer, 2018). Think tanks have addressed the issue in multiple ways, including holding symposia with and creating training materials for technologists, congressional staffers, journalists and civil society members to train them to become more discerning about false and misleading information (Boyd and Haven, 2021; First Draft, 2021; Witness, 2018), mapping disinformation spread, particularly with regard to Russian influence (Bodine-Baron *et al.*, 2018; Rondeaux, 2019), critiquing automated content delivery methods (Nadler *et al.*, 2018) and suggesting policy solutions for platforms (Caplan, 2018). One think tank event for the “Commission on Information Disorder” was even organized to “deliver recommendations for how the country can respond to this modern-day crisis of faith in key institutions” guided by commissioners such as “Garry Kasparov, the chess champion and Kremlin critic; Kathryn Murdoch, Rupert Murdoch’s estranged daughter-in-law; and Prince Harry” (Bernstein, 2021).

These examples give the impression overall of a growing public consensus that mis- and dis-information is a societal ill requiring intervention and solutions if we are to conserve what is left of any expectation for “informed citizens” to engage actively in sensible participation in democracy. Alternatively, Bratich notes that mis- and dis-information phenomena and the discourse around it has taken a gloss of “moral panic” in ways that echo past scares around other “folk devils” (Hall *et al.*, 1978), like mugging, drugs or communism, in public discourse. The moral panic around misinformation is fomented by journalists, technologists, intelligence agencies, politicians and civil society organizations with war-like metaphors, often framed as an enemy that must be defeated, with the implicit assumption that it is desirable to return to “civil society” where experts are not questioned (Bratich, 2020). Bratich calls for simultaneous critical attention to the reactionary “war of restoration” encapsulated in right-wing slogans like “Make America Great Again” on the one hand, and on the other, the “centrist war on [counter-hegemonic] communications” (Bratich, 2020, p. 15).

The complexities are inherent to navigating across these varied perspectives and signal some ways in which teaching about misinformation creates both an opportunity and challenge for instructors in higher education. The authors were tasked in Spring of 2021 by our university with developing a 15-week undergraduate course addressing media and

information literacy that will be offered to all first- and second-year university students, as a response in part to what university-level curriculum stakeholders see as a generational problem of misinformation in the media ecosystem, and a presumed universal need to cultivate media and information literacy among undergraduate learners. We note that the very invitation to produce such a curriculum may rest on some assumptions of individual primacy and “literacy” as a possible “solution.” As we worked together to develop a course that encapsulated our different but inter-related standpoints, we saw an opportunity to engage in a program of learning research around the course curriculum development and its implementation with multiple sections of undergraduates (potentially hundreds of students each year, starting in 2022). We decided to engage in this line of research given we perceived that some ontological innovations (per diSessa and Cobb, 2004) were emerging in our curriculum development. This article presents the rationale for our curriculum design approaches and sets out an ongoing agenda of design-based research (DBR) to continue iterating the curriculum.

2. Literature review: a need for ecological literacy

The interdisciplinary scholarly homes of this paper’s authors include Communications, Media Studies, Information Studies and Learning Sciences. Our literature review provides an organizing framework for how mis- and dis-information phenomena is studied and conceptualized in a variety of different research fields. We had to grapple with these literatures in establishing our own evidence-based approach to teaching mis- and dis-information as a knowledge domain to undergraduates.

We draw from Milner and Phillips’ model of ecological literacy (2020), a fairly new framing contributing to mis- and dis-information research that sees the cause, problem and solutions for misinformation and disinformation as necessarily multifaceted and approaches the problem through its socio-technical systems components and agents that exist within structures of power; and importantly that agents can enact change in these systems. The application of the ecological metaphor to explain social relations has been criticized as flattening the role that power relations play in society, and especially in socio-technical systems (Nadler, 2019). However, Milner and Phillips, and others using ecological metaphors applied to social practices and objects can also attend sharply to power (Lopez, 2012; Mars and Bronstein, 2018; Van Dijck, 2021). Milner and Phillips assume that interconnected parts of socio-technical configurations have allowed misinformation to proliferate, and as opposed to falling into a nihilistic solipsism encouraged by the seemingly chaotic and overlapping sets of socio-technical arrangements, we should instead disentangle these arrangements with regard to structural power as its primary “locus of change,” similar both to certain interpretations of social shaping of technology (SST) (Barad, 2003; Wajcman, 2015) and critical informatics (Noble, 2016; Sweeney and Brock, 2014). The literature that we summarize here informed how we developed our proposed approach to teaching and provided the overall narrative line of the scope and sequence of the course material in our syllabus.

2.1 Scholarly approaches to understanding mis/disinformation (and their limitations)

In observing trends and reviewing the growing literatures on mis- and dis-information, we noticed that ontologically, while approaches vary, they share in common a meta-dynamic in the way of theorizing that ascribes an imperative for change to the problem of mis- and dis-information. This imperative and its logic and momentum often target the practices of actors or components of the systems as a focal point of causality for the problem, and thus as a locus of change. These logics are sometimes explicit and sometimes implicit in the given

theory or approach. For instance, we noted that scholarship in media literacy education places a primary “locus of change imperative” upon individuals and educational institutions to cultivate greater information literacies among the populace – assuming personal responsibility of individuals to change their information practices, at the individual level, as the primary locus of change.

We decided to organize our review of scholarly approaches by these observed targeted loci of change, identifying the loci in each heading, and specifying how adherents of each approach tend to focus on key causal logics (and thus targets for solutionism) in their mis- and dis-information research. We map these observations to better prioritize *how* we wanted to thoughtfully and mindfully teach our students about this complex range of phenomena, given what we see as limitations in some of the approaches.

2.1.1 Frameworks placing emphasis on information practices. The first locus of change we have identified in interventions to address misinformation is individual information practices, as we alluded above. Studies of misinformation across the globe routinely blame users for poor education and bad information practices (Chakrabarti *et al.*, 2018; Dodda and Dubbudu, 2019; Machado *et al.*, 2019; Nugent, 2018), arguing that people share misinformation due to a lack of trust in the media, largely seen as a puppet of the state because they lack sufficient media literacy skills to effectively spot false or misleading information (Guess *et al.*, 2020).

However, research has shown people are embedded in personal networks in which they communicate in different ways (Matassi *et al.*, 2019). We know that online, people share things, not just based on what they perceive to be the truth content of a given piece of information but also on how well it coincides with their pre-existing ideological beliefs or strikes an affective chord (Kreiss, 2017; Lazer *et al.*, 2018; Osmundsen *et al.*, 2020; Tripodi, 2018; Wagner and Boczkowski, 2019). People share information because they want to draw attention to that information as false, they hope it is true or because the information simply coincides with their view of the world. Often sharing false or misleading content is justified by the excuse that “it was just a joke.”

Research and solutions addressing “fake news” as it relates to mis- and dis-information suggest a tie to media literacy, proposing that information literacy and evaluation skills are lacking in a section of or in the whole of the populace. Solutions for improved media literacy propose a number of different avenues; training journalists to become better curators of news (Phillips, 2018; Sunne, 2018), training the wider public to become better consumers of information (First Draft, 2021), often through information evaluation checklists (Berkeley Instruction Services, 2021) and other public campaigns online (Guess *et al.*, 2020). Yet, others suggest that these literacy campaigns must be introduced together (Huguet *et al.*, 2019), but even then, they will not completely stem the tide of misinformation because the problem extends beyond individualized information practices (Bulger and Davison, 2018; Paris and Donovan, 2019).

Media literacy education literatures tackle misinformation with a predominant focus on K-12 and draw upon traditional frameworks and definitions of media literacy that center on cultivating discernment in individual students. For instance, the National Association of Media Literacy Education defines media literacy as the ability to access, analyze, evaluate and produce both print and electronic media (Aufderheide, 1993). Media literacy education advocates and practitioners conceptualize misinformation and disinformation as types of propaganda intended to manipulate individuals and groups. Disinformation pedagogy typically emphasizes preparing learners to be able to identify and differentiate “fake news” sources and content from “real news.” While the outcomes of media literacy education curriculum fundamentally promote critical thinking skills, scholars are concerned this

approach may be more likely to promote doubt and skepticism instead of discernment and understanding (Boyd, 2018a, 2018b; Bulger and Davison, 2018).

Given these limitations, we sought to be cautious in our inclusion of “information practices” as a primary locus of change in our learning objectives and design choices. While we do include some activities that will likely bring about improved individual information practices, this is not the primary focus of our pedagogy.

2.1.2 Frameworks placing emphasis on technical fixes and tools for content moderation. The second most common locus of change centers on technical fixes for misinformation. Vosoghi et al. (2018) found that false, misleading and novel information reaches wider audiences at faster speeds than does true information. This happens on one hand because networks are designed to reward and encourage engagement, and on the other hand, because people engage with novel content in manifold ways (Crain and Nadler, 2019). Computer science, data science and some branches of HCI suggest technical fixes, such as “pro-social” social engineering, detecting bots, false information and bad actors, labeling, debunking, taking down or limiting spread of false or misleading content (Brashier et al., 2021; Garimella et al., 2017; Gupta et al., 2013; Jhaver et al., 2019; TruePic, 2021; Turek, 2018). But these fixes for media literacy have been found to be ineffective and are seen by conservatives, who more often generate and share misleading and false content, as proof of bias against conservative speech (Lyons, 2018; Ognyanova, Forthcoming; Tromble and McGregor, 2019).

Moreover, upholding technical fixes as a locus of change perpetuates a narrative that the technology is primarily to blame for misinformation. Focusing on technical fixes flattens and obfuscates that the reason these problems exist stems from the underlying profit motive of the technology industry, and that people bring their own interpretations and practices to their use of various technologies of information dissemination. Further, it promises that thorny social and political problems like misinformation can be addressed mechanistically and at a disembodied and “safe distance” through technical fixes. Here again, given these limitations, we wanted to err away from such technological determinist approaches that assume, for instance, that “inaccurate” information can be machine-identified and sorted and re-filed to its proper place, thereby overlooking a vast range of institutionally and state-sponsored disinformation that exists in “mainstream” acceptable channels. Such an approach acts to legitimize and reinforce the logics of market-driven ideology given these industries profit from the very existence and spread of mis- and dis-information, along with the misogyny and white supremacy showed to underpin the technology industry (Benjamin, 2019; Costanza-Chock, 2020; Ensmenger, 2012; Noble, 2018) which can quietly stay in place without too much outside examination and critique.

2.1.3 Frameworks placing emphasis on governance by national/state institutions. Yet others see the locus of change for this multifaceted socio-technical problem of misinformation as residing primarily within the realm of state and federal policy – the problem many of these studies indicate is that internal and external technology policy and governance has allowed the tech industry to run amok without any oversight or accountability. Broadly these studies argue that oversight and accountability should come from legal recourse, often embroiled in First Amendment issues. The traditional watchdog role of the press (over government) in democracy has been a pillar of the media’s role throughout the nation’s history (Schultz, 1998). First Amendment law has always been concerned with how government censorship and regulation stifles free speech. Legal scholars argue that interpretations of the First Amendment and of law, in general, serve the already powerful (Citron, 2016; Cover, 1986; Franks, 2018, 2019), granting those with

economic, ownership and pre-existing structural power the benefit of free speech, while everyone else lives with some notion of fearful speech (Franks, 2018).

Existing legal and platform policy and governance cannot effectively address the variety of intents, techniques and spread of mis- and dis-information. Even in the USA, there are many legal paths to stop misinformation from being disseminated. Contrary to popular opinion, the First Amendment does not protect all speech. Understanding how harmful speech has already been adjudicated offers some ways forward considering policy around misinformation in technologically-mediated information and communication spheres. Inciting, violent and defamatory speech are not protected by the First Amendment; increasingly, neither are child pornography and revenge porn. Each of these instances requires definitions of what does and does not constitute unprotected speech on a case-by-case basis in the courts.

In recent years, there have been laws introduced across the US states to criminalize revenge porn (Cyber Civil Rights Initiative, 2020) proliferating through technologically-mediated spheres. There has even been legislation introduced to stem the tide of visual mis- and dis-information (California State Legislature, 2018; Clarke, 2019; Malicious Deep Fake Prohibition Act, 2018), but these regulations are still nascent and even in the best-case scenario, enforcement is likely to be uneven. Section 230 of Title 47 of the 1996 Communications Decency Act is a divisive, widely-recognized, but little-understood legal code that exemplifies uneven adjudication of speech online. It was put in place nearly 30 years ago to allow online platforms to remove harmful content identified by users while avoiding civil liability for user-generated content. However, today, online platforms have much more economic and political power than they did in 1996. In the past few years, it has become clear that Section 230 is woefully insufficient to meaningfully address the gamut of problems brought by massive upticks in online platform use including the proliferation of hate speech, conspiracy theory content and co-organizing that occurs adjacent to such material as it leads to offline acts of harm.

Further, pragmatic challenges of content moderation among tech companies include the limits of automation and the psychological harms moderation causes human hand-coders. Thanks to Section 230, powerful platforms are not held accountable or forced to meaningfully act in the interest of the public, all the while the public pays the cost. There are many interpretations of Section 230, how it affects online discourse and what should be done about it. This course endeavors to unpack policy and perspectives around First Amendment issues of speech online to encourage a better understanding of the socio-technical systems present in internet governance.

Calls to break up big technology and corporate media conglomerates aim to address the overall problem of monopoly and demonstrate government leaders' concerns that these corporate interests that shape public discourse hold outsized power. However, in recent years, investigations and hearings around Facebook, Apple and Google have not produced meaningful change (Sorkin *et al.*, 2021; U.S. House Judiciary, 2021). In the future, our teaching approaches may include more concentrated discussion around governments as another layer in the complex ecosystem that bounds mis- and dis-information phenomena. But, for this iteration, our inclusion of political economy into our teaching approaches performs the work of including government actors enacting policy into our ecological understanding of the problems at hand. However, we err away from an approach that would lead students to an assumption that policy alone, more modes of governance or government experts would promote the social good or the public interest.

2.2 Our prioritized definition of mis/disinformation

Caroline Jack's (2017) paper, the "Lexicon of Lies," draws from previous distinctions between mis- and disinformation (Shultz and Godson, 1984; Fetzer, 2004; Fallis, 2009, 2015). Jack defines misinformation as false information that is unintentionally generated and/or unintentionally spread; she contrasts this from disinformation that is knowingly false and spread with the intent to deceive, often for political purposes. Often, the generation and spread of false information is harmless; it can be a means of expression, an honest mistake or anything in between. As such, we need nuanced language, such as her taxonomy of mis- and dis-information as well as the definition distinguishing the two types of false information, to frame our conversations of the problems of and possible solutions. She argues that the words we use to describe the manifold instances of media manipulation can lead to "assumptions about how information spreads, who spreads it, and who receives it" (Jack, 2017, p. 3). These assumptions shape conditions of possibility for solutions or interventions to these problems, as well as how (and what) we might collectively determine would be appropriate or desirable outcomes.

Jack's framing, along with our review of the literature bring us to a preference for developing pedagogy to address false and misleading information built upon critical, cultural and political economic conceptualizations that are common in social shaping of technology (SST) theory. SST sees technology and meaning-making as socially-constructed, as these material and symbolic interpretations and instantiations are enacted through various sites and practices of social interaction (Barad, 2003; Wajcman, 2015). As meaning and technology are configured socially, they may also be re-configured socially. SST's concept of reconfiguration represents the ability for people to mobilize socially to re-set the grounds for material and symbolic interpretations. While some criticize SST as over-privileging the social and ignoring the real constraints technology exerts into socio-technical systems (Sawyer and Jarrahi, 2014), we argue that paired with critical informatics, SST provides a useful lens for disentangling problems within socio-technical systems and situating these problems within their attendant constellations of social power, so that we may think more clearly through a multifaceted approach to understand, diagnose and address the various problems of misinformation in contemporary society, in such a way that highlights and empowers agency of individuals and collective publics (Costanza-Chock, 2020; Feenberg, 2014; Noble, 2018; Roberts, 2019).

As we think about the learning outcome of "agency" in particular, we draw from Paris, Reynolds and McGowan's (2021) critical informatics interpretation of Feenberg's notion of technical citizenship (2017a) that proposes a mode of "conscious co-production" (p. 11) where the actions of users have an ability to affect the codes and designs that define roles of the users within the technological network. The authors (2021) note that per Feenberg, this conscious co-production of systems from below results when ordinary, non-experts are enrolled in technological networks in ways that encourage them to develop a situated, practical knowledge of the network itself and avenues to exercise this knowledge (p. 3). This situated knowledge and related practices can be cultivated as insider power that can be exercised over technological development, which when exercised with care, can upend unequal power relations and promote more ethical socio-technical relationships (p. 3), in these authors' case, in proposed pragmatic efforts of for instance citizen regulatory bodies such as data ethics boards (2021).

Critical informatics perspectives differ from some of the other approaches we have outlined above, as they account for and accommodate the interconnected, dynamic complexity of the many systems and levels of analysis at play in mis/disinformation phenomena. Critical informatics is a mode of studying how design, development,

deployment and use of technical information systems is shaped by and reflects structural power; importantly, this field of study looks to advance multifaceted socio-technical change to address socio-technical problems. The locus of change in critical informatics perspectives on mis- and dis-information draws from black feminist social epistemology, cultural studies and neo-Marxist critical theory to focus squarely on systems and practices of power and oppression in information systems (Day, 2007; Noble, 2016, 2018; Sweeney and Brock, 2014). Critical informatics argues that the locus of change necessarily resides within all sectors. By understanding complex socio-technical phenomena with regard to power, we see more clearly the avenues to build power within the less powerful sectors of society – those most affected by the machinations of mis- and dis-information – to push for self-determination.

To understand and teach about all this complexity requires the cultivation of learners' sociological imagination and the capacity to think in symbolic ways about levels of analysis in society and our social worlds. Our course aims to contextualize mis- and dis-information in what might be seen as an ecosystem of inter-dependent socio-technical system forces and counter-forces, with a special emphasis on understanding the role of power in inter-dependent materially capitalist and culturally white supremacist systems of oppression at work in society. One may ask what this has to do with mis- and dis-information. Understanding sociological concepts like capitalism, neo-liberalism, culture, oppression, intersectionality and power are fundamental in this work.

While difficult to study and especially to teach, we suggest that we owe it to our students to trust that they have the capacity to develop in their sociological imagination. In this way, we have found [Milner and Phillips \(2020\)](#) ecological literacy has been a particularly fruitful advance in scholarship to help more clearly articulate the complexity of systems, forces and factors at play. We propose that Milner and Phillips' ecological literacy is squarely situated in critical informatics approaches, and therefore, it represents a fitting lens for our adoption as a type of "learning outcome" we aim to cultivate in course participants. In developing the course, we have therefore provided some anchors for students' own reading about ecological literacy, but for the most part, we have attempted to undergird and support this learning objective with a scope and sequence of conceptual building blocks that may lead to the actual achievement of this noble endeavor – especially given that ecological literacy presumes a fairly rich and deep set of prerequisite understandings and insights. We have chosen to prioritize a specific set of theoretical standpoints given the limits and confines of a 15 week 3-credit course. These are described in the Methods section, where we articulate the "Intervention."

3. Development of the syllabus

As curriculum developers with a mind toward interdisciplinarity and innovation, we sought to approach this course design invitation with the aim to expand students' horizons on the very nature of the complexity of these issues. We aimed to develop an accessible class geared toward students at the given grade level (early-phase undergraduates), building upon some cutting edge scholarly standpoints and perspectives on misinformation, stemming from across our multi-disciplines. As researcher-practitioners, we collaborated over a period of four months to establish a theory-driven syllabus that we intend to iterate in a future DBR empirical study in 2022 and beyond at our home university.

[Wang and Hannafin \(2005\)](#) define DBR "as a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories" (p. 6). DBR has developed into an influential method and mode of inquiry in the fields of education

research, instructional design and learning sciences, advanced almost two decades ago by a group of researchers called the “[Design-Based Research Collective](#)” ([DBR Collective, 2003](#)). In 2003 and 2004, the journals *Educational Researcher* (2003, vol. 32, no. 1) and *Educational Psychologist* (2004, vol. 39, no. 4) dedicated entire volumes to the topic of DBR, described in the introductory article of the 2003 volume as “an emerging paradigm for educational inquiry.” The method and its more recent incarnations such as design-based implementation research ([Fishman et al., 2013](#)) and research-practitioner partnerships ([Penuel and Gallagher, 2017](#)) have figured prominently in the discipline of the learning sciences. It will be a useful method for us as we engage in future research to iterate upon this baseline syllabus, through implementation in future classes; we will address research questions relating to the theory-driven innovations we outline in this paper, around its knowledge domain and grade-level appropriateness.

3.1 Ontological innovation

Within DBR, learners interact with each other and what is termed an “innovation,” which is a key unit of analysis, as are the iterative design and development transformations for the innovation(s) themselves. The “innovation” in DBR can comprise: the learning content/knowledge domain, mode of instruction/pedagogy and/or designed technology environment and educational affordance functionalities. In discussing theory-building in DBR, [diSessa and Cobb \(2004\)](#) advocate for “ontological innovation” as a useful theory-building practice within DBR. In ontological innovation, the researcher operates experientially within the learning setting and observes closely for occasions that may manifest new possible theoretical contributions given the research question(s) of focus. Ontological innovation is initially an inductive theory-building process that can lead to iterative advancement in subsequent research studies, and ultimate deductive theory-testing once an ontological innovation is more fully formulated toward a theory. The authors state (2004, p. 99):

With regard to design, ontological innovations can delineate new competencies that become a focus on instruction (e.g., meta-representational competence) or can provide new goals for instructional environments (e.g., a productive ecology of sociomathematical norms). In addition, their formulation can lead to the reformulation of previously adopted instructional goals (e.g., intellectual autonomy as a characteristic of a student’s way of participating in the practices of a classroom community rather than as a characteristic of a student per se). Furthermore, an ontological innovation can orient the designer to scrutinize previously implicit aspects of a design.

The process of uncovering ontological innovation, as described by [diSessa and Cobb \(2004\)](#), is a key goal of the current study. We propose that our ontological innovation resides in our up-front conceptualization and critique here of the past literature on mis- and dis-information studies – namely, the critique calling out and questioning the often simplistic causal assumptions underscoring many past approaches to this topic – those that may, for instance, prioritize techno-solutionism, placing causal assumptions on specific system affordances or in contrast, place the onus on individuals to cultivate traditional definitions of “information skills.” Instead, we offer a syllabus that focuses on individuals’ growing understanding of socio-technical complexities, and, in turn, cultivation of their own political agency and will, as active agents who have the potential to both be affected by *and shape* technology policies in society as they relate to mis- and dis-information. We will test this innovation for its understandability as a knowledge domain for undergraduates, with research questions focused on student learning processes during progression through our syllabus narrative sequence. We will also consider the grade level and developmental appropriateness of this conceptual material for undergraduates, given it is more commonly encountered at the master’s and doctoral levels of study.

The rationale for this future empirical work is bolstered by the fact that more information science schools and departments are offering undergraduate degrees and majors (Lund, 2021). In general, curriculum centering on mis- and dis-information, and our proposed approach, address the mission of the iSchools Consortium, stated as fostering “interdisciplinary approaches to harnessing the power of information and technology, and maximizing the potential of humans” (iSchools, 2021). We expect our iterative empirical DBR study will be informative to other undergraduate educators as we further refine and improve the syllabus and its activities in learner-centered ways.

3.2 Learning objectives of the intervention/innovation

We format our learning objectives as primary (e.g. action verbs such as do/create/decide) and secondary (e.g. cognition/affect verbs such as know/believe/feel), following Horton’s Students Will Be Able To (SWBAT) model, which builds upon instructional design literatures in performance-based evaluation (Horton, 2011). Overall, we propose that students will develop ecological literacy and agency as technical citizens (Milner and Phillips, 2020) while cultivating constructive and practical information practices and digital content creation skills.

Primary objectives (action-based behavior/practice performance objectives):

After participating, SWBAT:

- (1) Explain key concepts related to misinformation, disinformation, and broader information manipulation clearly and effectively.
- (2) Employ responsible information behaviors and practices such as evaluating sources and content credibility, and using, curating and sharing content, applying knowledge gained in class, in the context of their work and everyday lives.
- (3) Identify and curb the spread of harmful mis- and dis-information in inter-personal exchanges and interactions with others online and in their everyday lives.
- (4) Create their own high quality digital content including an online Misinformation Case File Analysis, that demonstrates their understanding of the course material.

Secondary objectives (cognitive/affective/comprehension objectives):

After participating, SWBAT:

- (1) Recognize the range of sources of misinformation and disinformation in democratic society, and some of the causes and consequences of its spread.
- (2) Articulate how expertise of information sources plays into trustworthiness of content, and how scientific knowledge is produced through scholarly communication, peer review, and formalized systems of evaluation.
- (3) Disentangle the complex dynamics inherent to the flow of mis- and dis-information across socio-technical, media and information ecosystems, through a range of scholarly perspectives such as social and critical informatics, political economy of media and democracy, systemic racism and societal oppression, representation and culture, and others.
- (4) Reflect upon their own worldview and standpoint throughout the course, and their own agency in constructing how they interpret and enact information and media practices online.

The course we implement locally will have a size cap of 30 students, with multiple sections offered. Students meet 80 min twice/week, and for one of those days, we expect students will

prepare by reading and participating in in-class lecture attendance, which will include small group prompted discussions of lecture material. The other day will comprise completion of activities discussed in the syllabus below. The design of course activities was informed by integrated constructionist digital literacy development approaches that combine learning in a substantive subject area, such as science, social studies or social justice themes with cultivation of digital skills (Reynolds, 2016). Both the learning objectives and the syllabus below are designed as a tool to communicate both to students and instructors of the course.

4. Syllabus

4.1 *Brief syllabus summary*

In brief, within the course narrative, scope, sequence and flow, the Introduction (Modules 1–2) sets up the real-life scenario and problems that we will learn to grapple with, analyze and understand through the semester. In this section, students learn about what exactly mis/disinformation is, the different manifestations and how we can think about it in systematic, rigorous ways that can help us better understand and navigate social and technical systems that produce and disseminate information, discourse and social cohesion, and lead us away from conspiracy and mistrust.

Part 2 (Modules 3–10) is grounded in theoretical, analytical tools and examples that help students better understand and analyze these problems around misinformation introduced in the first part. They include thinking about misinformation through political economy, intersectional analyses around race, gender, gender and class and psychological theories around bias and interpretation, and adding analytical tools drawing from critical informatics approaches, rhetorical and discourse analysis and intersectional analyses. This problem context affords the opportunity to teach students about the nature of socio-technical systems and the many complex inter-relationships among the actors constructing and inhabiting them, with an eye toward the role of power and ideological forces and assumptions, such as capitalism and white supremacy that relate to the creation, publishing and spread of mis- and dis-information from both official and unofficial sources and actors. Students have the opportunity to develop their understanding about how the given examples came about, growing to understand that a range of scholarly frames of reference for these phenomena exists.

Part 3 (Modules 11–12) is dedicated to how the world might be otherwise. Here, we address how the problems of misinformation brought up through the first sections can translate into real-world practices and action involving mobilizing an information and communication ecology of actors in a way that promotes a better future. In this section, we talk about how to use and analyze literacy checklists from our critique of the “personal responsibility” locus of change and building on the critiques of danah boyd (2018a, 2018b), Milner and Philip’s work on literacy and misinformation ecologies (2020). We also raise the topic of how students might engage in conversations with people about misinformation based on new insights.

The course overall aims to help students disentangle the complex socio-technical arrangements of mis- and dis-information, placing emphasis on a critique of structural power as its primary “locus of change.” We have built activities to allow students to become conscious that they all hold a memetic frame that inter-operates with the frames of those around them and grow to evolve this frame through cultivation of the sociological imagination of 200-level undergraduates. We offer experiences that aim to help students grow to become more empowered in their own media habits, learning how to engage in activism around these topics and to work in solidarity with others to bring about policy and society shifts through a greater understanding that individuals and collectives can act as change agents through organizing and demanding better policies to might bring about a

world that sees these problems of misinformation, inequality, extreme polarization eliminated, ideally or at least attenuated to the point of creating a more live-able world.

Disinformation detox

An undergraduate course syllabus

Catalog description

This course offers the opportunity to examine the rampant spread of misinformation and disinformation from technical, social, cultural, political and economic perspectives. Through course readings, assignments and activities, students will raise their consciousness of their own position and agency as interpreters of media texts, and grow to develop an understanding of digital participation and citizenship in democracies; systems of power and oppression *vis-à-vis* race, gender and political economy of media and technology ownership; how audiences engage with texts and misinformation at individual and group levels. Students will also learn about cognitive bias as it relates to media frames and arguments, and reflect on the health of their own mediated practices with devices, systems and personal well-being. The course aims to cultivate student agency as active, responsive and responsible participants in today's complex digital/online and mediated social systems.

Major assignments

In and out of class activities (count toward class participation) (30 points in total):

- Week 1, Activity 1: Misinformation Examples (3 points) [Learning Objective Targets (LOT): 1, 2, 3, 4, 8].
- Week 2, Activity 2: Quiz on Science Life Cycle (3 points) [LOT: 1, 2, 6].
- Week 3, Activity 3: Where do you get your news? Reflection (3 points) [LOT: 1, 2, 3, 5, 8].
- Week 4, Activity 4: Media Ownership Reflection (3 points) [LOT: 1, 2, 7, 8].
- Week 7, Activity 5: Analysis of information infrastructure (3 points) [LOT: 1, 7, 8].
- Week 9, Activity 6: Group Work: Black Press Research Collective Database (3 points) [LOT: 2, 4, 5, 6, 7, 8].
- Week 10, Activity 7: My Mimetic Frames Reflection (3 points) [LOT: 3, 8].
- Week 11, Activity 8: Counter – examples (3 points) [LOT: 2, 3, 5, 6, 7, 8].
- Week 12, Activity 9: Visualize Your Social Media Use (3 points) [LOT: 1, 4, 5, 8].
- Week 13, Activity 10: Dialogue and Deliberation (3 points) [LOT: 1, 2, 3, 5, 6, 7, 8].

Assignment 1 (25 points): Open Book Synthesis of Key Concepts from Weeks 1–6 (due Saturday night of Week 7).

[LOT: 1, 5–7]

To demonstrate your understanding of key terms, definitions and concepts from Weeks 1–6, this assignment invites you to respond to four essay questions (5 points each), synthesizing readings and lecture materials in your own written voice. This assignment is fully open-book and open-note, and you can revisit all lecture videos and activities as you craft your essay responses. Each question requires a minimum of 400 words and four references to required course readings. The questions are highly detailed and multi-part, offering structure for your synthesis. This is NOT a group assignment. You must work on your own in crafting your

answers. However, you may study with other classmates as you organize your notes and review the prior weeks' materials in preparation for Class 1 in Week 7. Class 1 in Week 7 will provide a review session in which you use in-class time to discuss readings with your classmates in small groups and with the instructor at the class level. Just after Class 1, the essay questions will be released. Class 2 will be work-from-home on your own. The assignment will be due on Saturday following Week 7 at 11:59 p.m.; you are welcome to turn it in earlier. Your responses will be graded based on:

- specificity and clarity in your explanation of ideas from the readings;
- writing quality (proper sentence structure, punctuation, grammar, spelling);
- use of references, paraphrasing, proper quotations;
- answering of the given question; and
- creative synthesis and analysis of ideas in the readings, within and across weeks, demonstrating your understanding of key concepts and their relationships.

Assignment 2: Final Assignment (45 points): Misinformation Case File Analysis

[LOT: 1, 4, 5, 7, 8].

For this final project, students will choose a current events topic around which mis- and/or dis-information has been problematic. Using the ecological literacy and understandings you have gained this semester, you will analyze specific examples of misinformation in this topical area (with examples stemming from formal journalistic sources and/or informal sources, such as user-generated content and memes that you have found circulating online). You will choose at least one theoretical lens through which to analyze the mis-information's content, authorship and origins (choose one-political economy, systemic racism, intersectional feminism, social/critical informatics, culture and representation, etc.); discuss the socio-technical dynamics (e.g. search engine/social media functionality) that enabled its dissemination/spread; discuss the possible psychological dynamics/effects with audiences. The final deliverables for this assignment will be:

- (1) an entry on the PBWorks class Wiki, in which you post your notes, example links, a script/outline for your video screencast and any other general framing content;
- (2) a screencast video (5 min maximum) where you present your analysis in voiceover using a script in which you address the assignment questions above, and toggle through the wiki/other browser tabs, where you demonstrate and show the viewer examples of the misinformation and your interpretation and analysis; and
- (3) written comments of at least 200 words each, below at least four classmates' PBWorks wiki entries (Please try to choose classmates on the site, who do not yet have comments posted, so everyone receives input!).

Summary of graded assignments

Learning assessments.	Value toward final grade.
In-class activities (counts toward class participation).	30 points, 30% of grade.
Assignment 1: Open book synthesis of key concepts from Weeks 1–6.	25 points, 25% of grade.
Assignment 2: Final assignment: misinformation case file analysis.	45 points, 45% of grade.

A: 90–100
B+: 85–89
B: 80–84
C+: 75–79
C: 70–74.

Readings and activities

Section 1: Introduction

Module 1: What is misinformation and disinformation?

This week sets up the problems we will explore in the class; how information literacy and media literacy are bound together; introduces what misinformation is, how it differs from disinformation; different types of misinformation; why misinformation is a problem of interpretation and dissemination (COVID examples), and offer a set of hopeful heuristics for literacy of all types, scientific, information, media, etc., from Carl Sagan, which is often an introductory reading in digital/information/media literacy courses. All these topics will be revisited iteratively and expanded upon through the course.

Key questions: What is the difference between mis- and dis-information? What are some examples of misinformation and disinformation you have encountered? How do you know? Who do you trust? Who do not you trust? Why?

Definitions: misinformation, disinformation, propaganda, media literacy.

Sample Readings (choose some for students, some for instructor prep):

- Thaler (2016), Ball and Maxman (2020), Ognyanova *et al.* (2021), Sagan (2007) and Jack (2016).

Activity 1: Misinformation examples (3 points)

Contribute examples of misinformation you have encountered to class GDoc (will be used in subsequent class discussion).

Module 2: Scholarly knowledge, scientific evidence, discourse and communication and expertise.

This module introduces concepts around the scientific method and scholarly communication. This week is really about expertise, how it is built and how to navigate it, rather than being mistrustful of it, outright.

Key questions: How is scholarly knowledge generated in society, and how do scientific paradigms shift/evolve across history? What role does journalism play in communicating timely scholarly/scientific knowledge and discourse, for instance, in the case of disasters, public health crises and politics? How do scholarly knowledge and expertise of sources play into trustworthiness?

Definitions: Scientific Paradigm Shift (per Kuhn), scholarly knowledge building and communication, theory, inductive/deductive reasoning, scientific method, sociology of science, peer review, primary and secondary sources, scholarly and popular resources.

Sample readings:

- National Academies Press (2021), UCLA Library (2021), Babbie (1994), Newhagen and Bucy (2020), Stenwedel (2011), Marwick and Lewis (2017) and West and Bergstrom (2021).

Library evaluation guides

- Rowan College, Evaluating Online Resources <https://libguides.rowan.edu/EvaluatingOnlineSources>

- UC Berkeley Evaluating Resources <https://guides.lib.berkeley.edu/evaluating-resources>

Activity 2: Quiz on science life cycle (3 points)

Students take a quiz about the University of California Los Angeles (UCLA) Science Life Cycle resource.

Section 2: Understanding misinformation: theories, tools and examples

Module 3: Journalism, citizenship, democracy.

This section engages media literacy as it demonstrates students how journalism should and does function within society. As Week 2 engaged scientific expertise, Week 3 engaged journalistic expertise and teaches students how it works, where it comes from and how to effectively navigate it, instead of being mistrustful outright.

Key questions: What is the role of journalism in a democracy? How do journalists serve as translational bridges between experts and the lay public? How has journalism changed in today's digital culture?

Definitions: democracy, social democracy, citizenship, journalism, the 4th estate, 1st amendment, watchdog/guard dog, citizen journalism, digital divide, "objectivity" and bias.

Key theories: The power elite (C. Wright Mills), 1st Amendment, 4th Estate, participatory culture (Jenkins), digital inequality (van Dijk).

Sample readings:

- Campbell, Martin and [Fabos \(2019\)](#), [Illing \(2018, August 9\)](#), [Silverman \(2015\)](#).

Activity 3: Where do you get your news? Reflection (3 points)

Write a 250-word reflection on where you get your news and how you determine whether the news is credible, what biases are at play, what are the source's claims to objectivity (both in the media you engage with and those biases you use to interpret stories you encounter), what type of news you are most/least interested in and why.

Module 4: Political economy of media.

This week offers students theoretical concepts of political economy and power, and how to use them in an analysis of their information/communication ecologies. The material shows students how to develop an informed capitalist critique rather than blaming "the media," "elites" and "academics" for co-optation while supporting capitalism and income inequality. This week focuses on how policy shapes and is shaped by our economic, information and communication context with Schiller, who is one of the first people talking in granular detail about how neoliberalism leads to gutted public institutions, and serves the double role of discrediting public institutions and enriching private entities that sweep in. Stuart Hall's work around encoding and decoding shows how the political economic function of news and entertainment is interpreted by different groups in conjunction with these groups relation to power, which explains mistrust on the one hand and the possibility for community-guided liberatory alternatives on the other. Halls' concepts will be revisited in the upcoming weeks. Nadler and Crain's work gives analytical tools from political economic analysis for thinking through communicative channels and how they are shaped by powerful interests without being conspiratorial.

Key questions: What is state policy around media, communication and information technology (IT), and how does that affect ownership and incentives, how messages are made and disseminated, and possible solutions to problems that arise? How have state policies allowed media consolidation/monopolies? How do the tools of political economic analysis help us understand contemporary practices of misinformation and doubt?

Definitions: capitalism, neoliberalism, ideology, hegemony, political economy.

Theories: political economy, encoding/decoding (Hall).

Look through:

<https://projects.iq.harvard.edu/futureofmedia/index-us-mainstream-media-ownership>

Watch:

(2015) What is Neoliberalism? Minute Theory. <https://www.youtube.com/watch?v=dzLv3rfnOVw>

Sample readings:

Bauer and Nadler (2021), Schiller (1995), Stuart Hall and Cultural Studies (ND) and McChesney (1999/2008), <https://www.visualcapitalist.com/who-owns-your-favorite-news-media-outlet/>

Activity 4: Media ownership reflection (3 points)

In-class discussion; each student produces a 250-word out of class reflection).

Reviewing where you get your news, reflect on media ownership and how that might influence messages in the sources you consume.

Module 5: Screens, culture and celebrity.

This week builds on previous weeks, particularly Weeks 4 and 3. We investigate the interconnected relationship between media producers and consumers across media platforms and national boundaries. Students consider how social media and contemporary technologies can simultaneously replicate older forms of production while creating new ones. Celebrity culture and micro-influencers provide context for how production practices are shaped by media consumption behaviors and may contribute to the spread of misinformation.

Key questions: How do social media and contemporary technologies replicate and change older patterns of mediated cultural production? What are some benefits of online culture? How does the political economy and affordances of platforms influence micro-celebrities production and dissemination of misinformation?

Sample readings/video:

Jenkins (2006), Abidin (2021), Lewis (2020), Marwick (2019) and Hay and Couldry (2011).

Module 6: Moderating participatory culture.

In Week 6, we ask students to examine how moderation policies can be enacted to limit harm but not breach free speech. This week our aim is to acknowledge the benefits of online culture while identifying patterns of misinformation dissemination at work within the larger media ecosystem. For example, big platform moderators from Global South Countries are often paid poorly for filtering difficult content, and in content moderation policy at tech companies, the interests

of people who are systematically disenfranchised are unrepresented, leading to harassment of and misinformation around groups that are systematically disenfranchised.

Key questions: How does participatory culture and user-generated content lead to information overload and misinformation? How can we imagine content moderation policies that limit harm but do not breach free speech concerns?

Definitions: echo-chamber, outrage influencer, illusory truth affect, propaganda, information overload, fake news, high arousal emotion, skepticism versus cynical, free speech v. fearless speech.

View:

What is an echo-chamber? <https://www.youtube.com/watch?v=Se20RoB331w&t=5s>
Chen and Casady (2017). *The Moderators*. Field of Vision. <https://www.youtube.com/watch?v=k9m0axUDpro>

Readings:

Donovan and Paris (2019), Vosoghi, Roy, Aral (2018), Bode and Vraga (2021) and Paris and Donovan (2019).

Module 7: Exploitation and automation.

This week we draw from Safiya Noble's "A Future for Intersectional Black Feminist Technology Studies" to think through how tech industry narratives/practices around AI and producing technical solutions for social problems do not have a sufficient analysis of social problems and how the tech industry practices are exploitative in their production practices, extracting resources and labor from the Global South, deriving value in wealthy countries and disposing of tech waste back into the Global South. In addition, in these wealthy countries, these tech practices leave out wide swathes of people who are not privileged to be in the tech sector or at the receiving end of existing socioeconomic hierarchies. We see this in her example of the hyper sexualization of black girls in google search results. This also harks back to past week's discussion of misinformation and harassment targeting groups that are systematically disenfranchised and introduce terms like intersectionality and the matrix of oppression that are useful for intersectional analyses of the information and communication landscape, that will be further developed in Week 8.

Key questions: How do socio-technical systems and their functionality contribute to the spread of mis/disinformation? What role does corporate media and information and communication technology ownership play in this spread, and in the exploitation of human intellectual pursuits, labor and natural resources?

Definitions: AI, machine learning, recommender systems, supply chains, digital colonialism, labor exploitation.

Key theories: advertising and news relationships, speed and scale of falsehoods on social media, content moderation, AI, matrix of exploitation, intersectionality.

Readings:

Noble (2016), Noble (2013), Crain and Nadler (2019), Matescu and Elish (2019) and Funke et al. (2019).

Instructor prep:

Exploitation; matrix of domination, intersectionality
Collins (1990) and Coastan (2019).

Economic exploitation

Matescu and Elish (2019).

Economic incentives for misinfo/How tech companies operate

Funke *et al.* (2019).

Activity 5: Analysis of information infrastructure (3 points)

Drawing from the section *The New Scramble for Africa: An Intersectional Analysis of the IT Sector* in the assigned Safiya Noble piece on Intersectional Technology Studies, produce an analysis of your engagement with a news story or set of narratives you have thought about in the past couple of weeks. Write as much as you can about what resources go into producing that news story and getting it to you. You will have to think about the device where you access the story, the labor and materials used to produce the device and infrastructure that allows the device to access news, the ownership of the outlet and the digitized environment, the work of the editorial team, the platform where you get the information and how that information gets to you, i.e. why does it show up in your feed, etc. If you are able, write about intersectionality, who is harmed and who benefits from the processes you have outlined.

Module 8: Review session; open book synthesis of key concepts from Weeks 1–6 (due Saturday night of Week 7).

This week serves as a take-home midterm for students using very specific, scaffolded guided question prompts generated by the Professor based on what was covered. Write-ups will be evaluated based on:

- specificity and clarity in students' explanation of ideas from the readings;
- writing quality (proper sentence structure, punctuation, grammar, spelling);
- use of references, paraphrasing, proper quotations;
- answering of the given question; and
- creative synthesis and analysis of ideas in the readings, within and across weeks, demonstrating understanding of key concepts and their relationships.

Module 9: Racism, racial bias, misinformation, disinformation.

This builds on the Hall reading from Week 4, the Paris/Donovan reading from Week 5 and automation/exploitation examples from Noble in Week 6, all of which address how people outside of the dominant/privileged culture experience and interpret media and information differently from those within the hegemonic sphere of experience. Here, we address structural/systemic lenses as well to ensure students ground their understanding of inequality before moving into some of the materials next week that do address individual-level cognition.

Key questions: What role do media play in reproducing/perpetuating racism, gender bias and other forms of societal oppression? How has mis- and dis-information been deployed in online environments to actively platform hateful content?

Definitions: Intersectionality; racism; xenophobia; gender bias, hate speech.

Sample readings:

Adamson (2016), Kuo and Bhaman (2021, March 23), Tharoor (2021), Asian American Feminist Collective (2020) and Marwick and Miller (2014).

Activity 6: Group project on Black Press Research Collective database (3 points)

- Form groups of 3–4.
- Step 1: Review examples from the Black Press Research Collective database of Black press representations provided (e.g. <http://blackpressresearchcollective.org/resources/scholarship-archives/>; <http://blackpressresearchcollective.org/resources/online/>), that were published in formal journalistic sources written by and for Black communities in context. What are some observed qualities of press articles written by the community for the community?
- Step 2: Consider any recent racist or racialized examples of coverage from Black press or mainstream media of themes related to Black experiences that you are aware of (e.g. around COVID, vaccines, health disparities, etc.).
- Discuss the differences in the political economic, encoded messages and digital infrastructure ecologies that are reflected in these comparative texts.
- Consider the varying effects of both. How do these forms of representation (as discussed by Stuart Hall earlier in semester, reproduce/reinscribe/reinforce/challenge systems of oppression and inequality?).

Module 10: The psychology of misinformation.

Our individual psychological biases influence how we select, organize, categorize, use and produce information. At times, our belief systems work against our ability to discern fact from opinion. Milner and Phillips describe our deeply held beliefs as memetic frames. Our frames arise from the deep stories we tell ourselves about who we are and what we stand for. These beliefs are so deeply embedded into our concept of self we may not even notice they exist. The intention of this module is to encourage students to examine their deeply held memetic frames.

Key questions: How do our psychological biases at the individual level influence how we process, share and create media? Why do not facts matter in combatting misinformation?

Definitions: cognitive dissonance, heuristics, dual process theory, cognitive miserliness, confirmation bias, motivated reasoning, confirmation bias, memetic frames.

Listen:

National Communication Association COVID 19 Conspiracy Theories <https://natcompodcast.podbean.com/e/covid-19-conspiracy-theories-1627582495/>

Sample readings/viewing:

Phillips (2019), Shane (2020), Popova (2014), Taddicken and Wofe (2020), Tripodi (2018, May 16), Confirmation Biases (<https://www.youtube.com/watch?v=vKA4w2O61Xo>).

Activity 7: My memetic frames reflection (3 points)

In 250 words or more, write about what biases you carry with you. How do these biases influence how you interpret news stories and information? Think about how

your background and upbringing and the values you and your community hold and how that influences your worldview. Remember that even saying “I am not biased” is a biased perspective.

This assignment intends to get students to explicitly reflect on their ideological position – to be able to see it and understand what it means in terms of how they interact with the world.

Section 3: Addressing misinformation: steps toward cleaning up a polluted information ecology

Module 11: Counter-practices.

Drawing on previous week’s discussions of Stuart Hall, Schiller, Paris, Noble, Nadler and Crain, we see that just because we have a polluted information and media ecology at present, it does not mean there are no alternatives, solutions or ways out. This week introduces students to activist practices of countering problems. We draw from examples in Alondra Nelson’s *Body and Soul* to talk about the health activism of the Black Panther Party; “making a way where there is none,” and from Paris and Pierre around how students can work in solidarity with community organizations to build tools that are not profit driven but useful to the information needs of particular communities. This week we discuss examples of the MIC center, tech will not build it, and labor unions as ways to combat some of the problems of our group exploitation and harassment we have been discussing all semester.

Key question: Now that we have seen a lot of problems, how can we bring about change?

Definitions: activism, counter-narratives, liberatory practices, state and corporate governance v. communitarian governance.

Video:

Cointelpro 101 <https://vimeo.com/15930463>

Sample readings:

- Nelson (2011), Feenberg (2011) and Paris and Pierre (2017, April 28).

Look through:

- Media, Inequality and Change (MIC Project) <https://www.asc.upenn.edu/research/centers/media-inequality-and-change-center>
- Tech Won’t Built It <https://scienceforthepeople.org/2018/09/25/solidarity-letter-tech-wont-build-it/>
- Kelly, K. (2021, March 15). *The Amazon union fight isn’t about money*. Vox. <https://www.vox.com/the-highlight/22320009/amazon-bessemer-union-rwdsu-alabama>

Activity 8: Counter-examples (3 points)

In 250 words or more, identify a few examples of counternarratives/counter design and what types of problems they address. Relate these problems and counter-design tactics to course material around expertise and amateurism, racial and economic discrimination and anything else that is pertinent.

Module 12: Screen time and mental health.

Digital technologies extend our natural abilities to communicate. The always-on nature of digital technologies provides little space for quiet time and self-reflection.

This week we discuss the relationship between screen time and mental health. Students reflect on their consumption patterns, identify healthy and unhealthy screen time behaviors and discuss the importance of establishing mindful media consumption practices.

Key questions: How does social media impact health and what strategies can we apply to promote mindful consumption? What is the nature and source of individual experience, knowledge and meaning? How can we mitigate stress induced by the digital ecosystem?

Definitions:

Information overload, cognitive load, mindfulness, social media fatigue and meditation.

Sample readings/viewings:

Siegel (2007), WSJ (<https://www.youtube.com/watch?v=Ig6I3prnlE&t=169s>).

Instructor Prep:

Provide students a copy of the digital stress test developed by Media Smarts (use this activity before the tracking activity). They should fill out in class and use the time to discuss findings.

https://mediasmarts.ca/sites/default/files/lesson-plans/lesson_dealing_with_digital_stress.pdf

Activity 9: Visualize your social media use (3 points)

Track your social media use over the course of one week (use the screen time app on the iPhone or digital well-being on Android). Make a graph of time spent on each social platform and the number of times you picked up your phone (per day and per week). Analyze your social media use. What surprised you about your use? Do you think you spend too much time using social media apps? Do your social media behaviors contribute to higher levels of stress?

Module 13: Final wrap-up: Combating misinformation through knowledge, collective action, dialogue and exchange: cultivating ecological literacy.

This week we return to the readings from Milner and Phillips to touch back upon our definition “ecological literacy” and what it means to understand complex media and information system ecologies, and build sociological imagination as we explore mis/disinformation. We consider how giving energy/light/attention to mis-/disinformation can actually amplify and exacerbate the problem as a “moral panic.” We return to the concept of memetic frames and invite students to revisit the ways in which this course had influenced their prior interpretive lens from when they first started that may be based more in their cultural/home upbringing. How has their interpretation of media/information content and their modes of production, circulation, distribution and notion of “gatekeepers” evolved? Building consciousness of their own memetic frame and how this frame is developmental over time, based on experience/learning. It is our summary wrap-up.

Key question: What are some basic tools and techniques for developing a critically literate mindset of resilience to mis- and dis-information?

Definitions: Network pollution, context collapse, Poe’s Law, memetic frame, light of liberalism, light of social justice, ecological literacy.

Sample readings:

Milner and Phillips (2020), Phillips (2020), boyd (2018a, 2018b).

Activity 10: Dialogue and deliberation (3 points)

Read through National Coalition for Dialogue & Deliberation <https://ncdd.org/rc/what-are-dd/> Resource Center overview.

Questions to consider: How can we foster communication processes that encourage all members of the community to feel heard? What internal barriers do you face when confronted with a point of view you disagree with? What steps do we individually and collectively need to take to facilitate effective communication outcomes (not shouting people down, marginalizing unpopular voices, shutting down our ability to listen, etc.)? Instructor can select a dialogue and deliberation method to model with students <https://ncdd.org/rc/item/4856/> (suggested: Conversation café model).

Students meet in small groups to discuss why having a process for dialogue and deliberation is important to facilitating long-term systemic change in a democratic society. Students take group notes on a GoogleDoc.

Module 14: Final project preparation

Work on final project.

Module 15: Final project preparation**5. Discussion and conclusion**

We argue that guiding students as they traverse this full scope and sequence of course themes across 13 weeks will allow students to achieve what Milner and Phillips describe as ecological literacy, about which they state,

Unlike liberalistic literacy, ecological literacy doesn't fight against the affordances of the information ecosystem. It doesn't assume that falsehoods are easily decontaminated by the application of facts, or indeed, that falsehoods are the only pollutants to worry about. It doesn't cast people as atomistic islands unto themselves. Instead, ecological literacy emerges from network complications. It foregrounds the downstream, communitarian consequences of falsehoods and facts alike. And it takes people's frames seriously. These frames might not be true, but they are real; they shape how people navigate the world. Understanding these frames—indeed, approaching them as basic features of the information ecosystem—is key to protecting our public lands. To get us there, ecological literacy zooms out, way out, to survey the entire landscape. (Milner and Phillips, 2020)

In conducting this zooming out, we build upon SST and critical informatics approaches to allow students to learn about the nature of socio-technical systems and the many complex inter-relationships among the actors inhabiting them, with a mind toward the role of power and ideological forces and assumptions such as capitalism and white supremacy that pervade the atmosphere. Students have the opportunity to become conscious that they hold a memetic frame that inter-operates with the frames of those around them and grows to evolve this frame through the cultivation of their sociological imagination.

In this way, our approach varies from teaching and instructional design approaches that may operate implicitly or explicitly from one or another assumed locus of change approaches that are described in the literature review (information practices of individuals; technical fixes; government/policy regulations, etc.). We offer that the social shaping and critical informatics lenses, while quite challenging, are fitting for the balanced and socially

situated emphases they offer, that place the interests of publics, especially those (masses) who are downstream, marginalized, under-represented, vulnerable and most harmed by the phenomena in question, as primary. We expect our foray into DBR around the first and subsequent iterations of this course implementation will provide key data and intelligence informing our ongoing refinements and improvements of the course in areas such as:

- Reading level of the assigned materials: Are they comprehensible to learners?
- Conceptual scope of the material: What prerequisite understandings are perhaps overlooked and need earlier incorporation?
- Sequence of the reading material: Are the concepts presented in a way that is logically cumulative?
- Design of activities and the final assignment: How best should the activities and final assignment be scaffolded at a more detailed level of design? (We will take into account the approaches of the instructors involved in implementation at our university in its first semesters.)
- Can we develop and publish an “instructional design kit” containing more detailed guided discussion question prompts and activity scaffolds?
- Can we develop and publish a replicable wiki course shell for the final assignment that allows students within and across course sections (and perhaps even universities) to share their mis- and dis-information examples and critiques?

We propose that our “locus of change” conceptualization of the mis- and dis-information problem domain is its own ontological innovation that we offer to the information and learning sciences research community and to curriculum designers and media literacy educators, placing an alternative emphasis in our work, on cultivation of student agency and Feenberg’s (2017a) technical citizenship that fosters conscious co-production from below to promote more ethical socio-technical relationships. Consciousness of such agency has to be realized, however, and hopefully can be sparked, in part through educational programs such as this one.

We also expect that instructional theory contributions will emerge in this DBR work as it pertains to the developmental appropriateness of teaching these socio-technical systems research paradigms to undergraduates in the growing undergraduate discipline of information sciences. Overall, through publishing this detailed curriculum development work and then following up with empirical DBR on its implementation, we hope and intend to spark others to consider and reflect upon how they are teaching undergraduates about mis- and dis-information in the information and computing science disciplines, as well as communication and media studies, and to contribute useful structuring parameters, conceptually and for instructional design, for those who do so. In the future, we will plan to publish the empirical results of DBR research to update the literatures on syllabus improvements that emerge from this line of educational research.

Note

1. For a fuller version of the course readings and up to 10 additional instructor prep material references/citations in each module, readers may contact the authors.

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