



Article

An Affirmative Approach to Teaching Critical Data Studies

J. J. Sylvia IV

Department of Communication Media, Fitchburg State University, Fitchburg, MA 01420, USA;
jsylvia3@fitchburgstate.edu

Abstract: This article proposes an affirmative theoretical framework for teaching students about social media, algorithms, and critical data studies and offers a concrete example of an assignment that can be used to help students better understand how social media sites impact our processes of subjectivation, or how we are created as subjects. This pedagogical approach is situated within larger conversations about how to best approach media literacy, digital literacy, and other emerging 21st century literacies. Drawing upon a pedagogical action research methodology, this article analyzes student projects and reflections to determine how one can actively participate in one's own processes of subjectivation as they relate to social media, as well as what factors facilitate or limit this ability. I argue that a deeper understanding of how platforms and algorithms function increases one's ability to intervene in their own processes of subjectivation. Further, I analyze student projects to demonstrate how the assignment helped students better conceptualize the ways that their data were being captured and then used by Facebook. This analysis showed that the inherent for-profit nature of the Facebook platform limits the possibility of intervention ability by design. These results suggest that new approaches to social media platforms, such as those that are non-profit or for the public good, might open further opportunities for more creative interventions. These experimentations at both the level of the user and the platform align well with an affirmative critical theory approach of experimentation and counter-actualization.



Citation: Sylvia, J. J., IV. 2021. An Affirmative Approach to Teaching Critical Data Studies. *Journalism and Media* 2: 641–656. <https://doi.org/10.3390/journalmedia2040038>

Academic Editor: Jason Whittaker

Received: 29 August 2021
Accepted: 13 October 2021
Published: 21 October 2021

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2021 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Keywords: social media; Facebook; processes of subjectivation; critical data studies; posthumanism

1. Introduction

Much of the social media curriculum developed to date aligns closely with a model of higher education aimed at job preparation, and is therefore designed to teach social media skills and strategies meant to prepare students for future professional positions (Brocato et al. 2015; Kim and Freberg 2016). Additional approaches have explored how to include and assess social media-based assignments as pedagogical learning tools that are integrated across multiple disciplines in order to increase student engagement (Abe and Jordan 2013; Sylvia IV 2014). While such approaches are important, much less research has explored how to help students better understand the impact that social media has on society, themselves, and their own development as subjects. Critical digital literacy pedagogy uses interdisciplinary frameworks to help students develop the skills needed to better analyze and interpret social media messages, especially in the context of the platforms and algorithms in which they exist (Talib 2018). An affirmative approach asks students to take such an analysis further, exploring how their use of social media and the affordances and limitations of the platform affect their own processes of subjectivation.

This approach is meant to intervene in ongoing conversations about how to teach data and media literacy. A literacy approach to pedagogy is grounded in the work of Paulo Freire, who argued against the traditional “banking” model of education in which experts simply deposit information into students (Freire 2000, 2013). Instead, he advocated for education to raise the critical consciousness of students in a way that allowed them to apply their technical skills to real-world problems aimed at achieving emancipation. This focus on using tools rather than simply banking information was widely adopted in

media literacy pedagogy practices. However, danah boyd (2017, 2018) has argued that production-focused approaches to media literacy in the last few decades have backfired. Such approaches assumed that simply teaching students how to use the tools that would allow them to produce media would lead to students who were media literate. In other words, while students learned the technical skills, they were not regularly applying these skills ways that addressed important community-based problems. This approach perhaps achieves one very narrowly defined goal of media literacy, but has backfired in that it has created a generation of students who understand well how the media can be used to manipulate the truth and spread misinformation. Unfortunately, these students were very often not given guidance about when it makes sense to believe or trust the media that they encounter. This lacuna of trust has created a situation where one may see everything as problematically biased, without having the tools to piece together a coherent world view. The quick rise of social media and big data in the last 15 years has only deepened this crisis, leading to much concern about a variety of different literacies (digital, data, information, media, meta, etc.) in the wake of public concern about fake news. Some media literacy advocates have worked to develop checklists that students can use to detect fake news or to advocate for more emphasis on critical thinking skills ([The News Literacy Project n.d.](#); [LaGarde and Hudgins 2018](#)). However, these approaches tend to become outdated quickly as purveyors of disinformation adapt their own practices, and ultimately, tend to only reinforce a critical perspective that casts doubt rather than building affirmative epistemological practices ([Sylvia IV 2022](#)).

Legislative efforts have begun to address these challenges in primary and secondary education, with many states requiring media and informational literacy (MIL) competencies as part of their curriculum. However, very little training exists for MIL pedagogy, so although new teachers may have more exposure to technology, this does not translate into preparation for teaching digital or MIL literacy skills ([Gretter and Yadav 2018](#); [Lindstrom et al. 2016](#)). Significant efforts are currently underway which are aimed at developing various digital literacy outcomes. For example, [Tandoc et al. \(2021\)](#) have developed a social media literacy scale that breaks the outcomes into the categories of technical competency, social relationships, informational awareness, and privacy and algorithmic awareness. Developing such literacy scales is a valuable step forward in developing MIL pedagogy training, but one challenge that remains is how fractured such approaches remain. For example, K-12 curriculum often focuses on media literacy, while higher education curriculum and library outreach often address information literacy ([Oberg and Ingvaldsen 2016](#)). Additional literacies, such as data literacy, are often either not addressed or included as minor subtopic within one of these approaches.

The blossoming of new literacies needed in the 21st century has led to divergent strategies for how to best pedagogically address these needs and challenges. On the one hand, there has been a call to adopt metaliteracy pedagogical practices, which might serve as an umbrella term and addresses multiple literacies and the skills and methods of thinking that apply across them ([Mackey and Jacobson 2014, 2017](#)). On the other hand, there is emerging literature that supports practices grounded in critical theory. These have variously been described as critical pedagogy, critical digital literacy, or critical data studies, among others. Both of these approaches offer significant potential for addressing the challenges of the need for a wide range of literacies in the 21st century. However, my project ultimately advocates for a critical digital literacy that highlights an affirmative approach to critical theory.

Emerging work in the broadly construed area of critical digital literacy has offered important lenses through which to understand the approach. Catherine D'Ignazio (2017, p. 7) has argued that "regrettably, data literacy has been relegated to a set of technical skills, such as reading charts and making graphs, rather than connecting those skills to broader concepts of citizenship and empowerment", perhaps repeating some of the mistakes of media literacy writ large in the past decades. She goes on to argue for what she terms a creative data literacy, which makes data more accessible to students and allows for their

use in concrete ways that address real-world problems. She and her colleagues have demonstrated this through working with students to create data murals in (Bhargava et al. 2016). Saman Talib (2018, p. 58) argues that “another important aspect of critical pedagogy is that it is not enough to merely analyze and critique texts, but students are also required to take activist action as a result of their analysis”. This emphasis on action after critique more closely connects literacy projects to the goals and outcomes associated with Freire’s pedagogy of the oppressed.

My own approach in the work that follows below aligns closely with Annette Markham’s approach to critical pedagogy. Markham (2019) has developed an autoethnographic assignment where students observe and reflect on their own digital lives. She argues that in this approach she is “functioning as a pedagogue more than an empirical researcher. The research outcome for me is not to provide answers but to raise questions and cause a chain reaction whereby participants raise their own questions and ask their parents, siblings, friends, and colleagues to also raise questions” (Markham 2019, p. 3). I orient my own work largely within this critical approach to pedagogy as it relates to emerging literacies. At the same time, I believe it is important to ground such approaches more closely within the critical theory frameworks from which they emerge.

Emerging approaches to affirmative critical theory, often aligned with posthumanism, emphasize analysis that is focused on processes rather than fixed entities, or “becomings” in the scholarly lineage of (Deleuze and Guattari 1980; Braidotti 2013; Sylvia IV 2021). An analysis of such processes requires the use of cartographic methods in which one is able to clearly understand and articulate one’s own position within assemblages that are made up of living and non-living entities alike. N. Katherine Hayles, for example, explores how the assemblages of humans, data, and technical systems can create a cognitive nonconscious (Hayles 2017). Understanding one’s own role in such assemblages is becoming more complex as technologically rich uses of big data are expanded. The assignment developed and shared here offers students an opportunity to begin the cartographic work of understanding their position within social media assemblages. One further important aspect of posthumanism is an ethics of counter-actualization, which requires one to affirm an event and then respond creatively to it in ways that open new opportunities of becoming. Deleuze, for example, cites a soldier who counter-actualizes the pain of his wounds as a theme for his artistic endeavors (Deleuze 1969). This requirement moves beyond critical approaches that aim only at critique. For this reason, my assignment asks to students to actively and creatively intervene in their own processes of subjectivation related to social media. Posthuman theory remains highly abstract. I hope that this article can begin to articulate pedagogical approaches to using posthuman theory and methods from a pedagogical perspective by offering an example of how it can be built into a clear and concrete assignment.

Much of the contemporary research on social media attempts to analyze current practices related to its use (boyd 2014; Turkle 2011). My project differs in that it asks students to actively raise their own awareness about their use of Facebook and Facebook’s use of their data and then actually take action to change that relationship in some way. This study does not in any way attempt to definitively identify or explicate the full spectrum of possibilities related to Facebook and processes of subjectivation, but is instead an attempt to provide an experimental framework for participants to begin to understand and intervene in their own usage of the site. Like Markham, my goal with this project is aimed more directly at *raising* questions rather than answering them. My hope is that this project demonstrates how critical data studies can be linked with affirmative critical studies, offering students an opportunity to perform cartographies of their own positions within the realm of digital media, fostering their ability to then raise further questions. While this assignment and study focused primarily on Facebook, it could be easily adapted to accommodate many other social networks. A few students in the study did not have an active Facebook account, so accommodations were made that allowed them to use other platforms such as Google or Instagram in order to complete the assignment. This

study embraces pedagogical action research because I am experimenting with ways of intervening in my students' relations to technology as a pedagogy of social action and action research (Barge et al. 2008; Reason and Bradbury 2013; Niemi 2019).

Having situated my project within current curriculum development and research related to social media, and drawing upon the theoretical framework of posthuman media studies using pedagogical action research, I pose two primary research questions:

RQ1: How can one participate actively in one's own processes of subjectivation related to their Facebook data?

RQ2: What factors facilitate or limit this ability?

The answers to these questions will be derived from a qualitative analysis of the projects, reflections, and conversations generated as part of the project.

2. Materials and Methods

This research focused on a group of 36 students spanning two undergraduate courses (one in Communication and the other in Science, Technology, and Society) that took place in the fall semester of 2016. Students were given the option of opting out of having their data used for research purposes, with the opportunity to do so before the project began or at any point during the course. North Carolina State University's IRB approved the research project. All data collected were anonymized, though with an explicit notice and consent that projects using Facebook data about individuals are potentially susceptible to deanonymization. Additionally, while this assignment was first developed and used as part of this project in 2016, I have continued to use it as an assignment, even as I have moved in to teach different courses at a different university. Although I did not renew IRB approval at my new institution and therefore am not including more recent data, I have found that this assignment still works very well, is popular with students, and consistently helps students to not only better understand how their data are being used by social platforms, but also to raise better questions about such use.

Students completed a series of assignments related to their understanding of Facebook's use of their data. The project was broken up into a series of weekly reflections mixed with in-classroom activities. During the first week, students viewed their own Facebook News Feed while reflecting on how often they use Facebook, where the content on the News Feed originates, and how often they think about the source of the content that populates their News Feed page. For the second week, students worked in small groups to view and reflect on the ads that were presented during their use of Facebook. Specifically, they were asked to hypothesize what information Facebook ads were drawing upon for the targeting of ads and where that information originated. After this reflection, we worked together as a class to create an ad using Facebook's advertising platform, which offered an opportunity to experience the vast range of data categories outside of Facebook's own platform that can be used to target ads. For example, students could see how Facebook draws on databases that would enable targeting based on the number of credit lines a user has open. In this way, I sought to intervene in the students' processes of subjectivation by developing a deeper understanding of the ways in which they have been targeted for ads by other advertisers. Knowing more about why certain ads might appear to them can broaden the potential approaches that are used to intervene in these processes. After collectively creating this ad (though not ultimately paying to run it), students reflected on how they believe Facebook ads impact them and whether and how often they click on ads.

The next part of the project required students to download their Facebook ads topic list. Ads topics are based on Facebook Likes, but they allow for a much broader targeting of interests not limited to specific Pages (Constine 2011). The information that is available for download shows both the ads topics associated with a user as well as a list of recently clicked ads. While reviewing their own ads topics in class, students reflected on the following questions:

1. What is your reaction to seeing these topics? Do you recognize them? Are they the types of things you would expect for you?

2. Based on these data, how do you think Facebook understands you, or, in other words, how is Facebook constructing you as a subject?
3. What does Facebook seem *not* to know about you?
4. What do these data make you think about yourself and your use of Facebook?

Considering this series of weekly reflections, students were then asked to critically and creatively intervene in their processes of subjectivation related to Facebook through an artistic project in conjunction with an artist's statement that explains the intervention. Through this process I am both asking the students to intervene in their own subjectivation but also to use the artist's statement to reflect on the relative success or failure that they had in doing so.

There are important limitations to note in this approach. First, pedagogical action research is not aimed at generalizability. Neither the particular results of this assignment nor the analysis that arose from the work students completed should be understood as generating new, generalizable knowledge. Rather, this approach is aimed at generating a pedagogical approach that can be experimented with and adapted as part of ongoing conversations about how to best approach teaching multiple 21st century literacies. Further, on one hand, the sample size of students completing this project was small, numbering only at 36. Therefore, it is not clear if this assignment could be easily expanded to much larger numbers of students. On the other hand, that number of students is reasonably close to the number of students I might have completed this assignment in any one semester.

3. Results

After completion of the projects, I analyzed both the projects and students' reflections on the questions from the previous weeks. I would like to note that this analysis is important primarily because it demonstrates the success of this assignment in helping students better understand how their personal data are being used and deployed. The actual results of the analysis are limited to a particular moment in time of the Facebook platform. Such results are potentially interesting, and could certainly be compared and contrasted with results from another recent analysis. However, I share these results primarily to show how students were able to successfully think more deeply about their own use of and use by a social media platform. I will also argue that they suggest ways to extend future iterations of the assignment by offering new avenues through which students may counter-actualize their data use. Based on this analysis, three major themes emerged from student responses:

1. The for-profit design of Facebook impacts our processes of subjectivation
2. It is hard to re-shape the data-based "first impressions" created by one's initial use of Facebook.
3. Awareness of Facebook's functionality can impact how we use the service.

Before expanding on each of these in more detail, it is worthwhile to note that many students reported finding targeted ads both creepy and likely to contain viruses, thus they rarely intentionally clicked on the ads and for that reason did not believe that the ads affected them. One student wrote: "I feel creeped out that they know so much information about me and partner with other companies to expand their knowledge even more". Another reflected: "I usually don't click on ads because I thought they were virus related". Of course, Facebook marketers are widely aware that clickthrough rates vary from 0.02–3.2% depending on the type of advertisement used ([The Facebook Ads Benchmark Report 2013](#)). In other words, ad campaigns are considered successful even if consumers are "rarely" clicking ads. However, perhaps more importantly, recent work has demonstrated that the presence of such targeted ads make an impact whether or not the viewer actually clicks them. When a consumer knows an ad has been targeted toward them, they will then make an adjustment in their self-perception based on the implied social label of the ad, so long as the targeting seems to be accurate ([Summers et al. 2016](#)). In terms of processes of subjectivation, then, the viewing of the ad may be as important as clicking on it.

The first major theme to arise from my analysis is that the for-profit design of Facebook plays an extremely consequential role in how the site is constructed and which items

appear in the News Feed of each user, which in turn has an impact on the processes of subjectivation. One student project highlighted the relationship between the ads topics and subjectivation, claiming that, “This intervention of sorts shows that we are distinct from these inputs (ads topics), but they also shape who we as individuals are”. This was highlighted through their artistic project that showed an individual—“i”—which was ultimately carved out of the space inhabited by their ads topics (Figure 1). Another student was surprised to realize they were being influenced by data driven targeting: “I think their ads impact me because if I was already considering doing something, like buying concert tickets, and an ad for those tickets came up I would have thought it was a *coincidence and fate* I should buy them. (until now)”, (emphasis added). This response offers a concrete example of the way that targeted advertising was subjectivating this student as a consumer in a way that was outside their previous realm of comprehension. Indeed, many students, in looking over the list of clicked ads that were included with their list of ads topics, did not realize that they had been clicking on ads: “There were some ads that I did not remember clicking on, though my larger observation was that so many of the ads on which I clicked were ads that I apparently didn’t understand were advertisements at all”. Based on class discussions, it seems most likely that these ads were stories inserted into the News Feed that are only identifiable by a small gray “Sponsored” label, but otherwise entirely resemble a story shared by a friend. In this way, the ads designed to generate a profit for Facebook are shaping its users’ interactions and processes of subjectivation beyond their ability to recognize it as doing such.

Sid (band), Appalachian State University, Rodrigo Santoro, Woody, Kenny McCormick, Apple crisp, Johnny Knoxville, Indiana Jones and the Last Crusade, npr music, Winston-Salem North Carolina, Mast General Store, List of United States cities by population, Lowes Foods, Homer Simpson, Taken, Sexual attraction, Slice (Five for Fighting album), UKF Dubstep, True Activist, Bananas in Pyjamas, James Bond, The Beatles discography, Call of Duty 5: World at War, Reggae fusion, Bastiat Institute, Live Sum 41, Dr. House, Congressman Thomas Massie, Xbox 360 system top box, Stewie Griffin, Epic film, Gentleman (musician), WebKit, Political economy, Breakbeat, Kansas (band), The Beatles at the Jones and the Temple of Doom, Business and industry, Indiana Jones and the Temple of Doom, Rick and Morty, The News & Observer, Lettuce, Liberal Party (UK), Smash, Masala film, dave matthews band, Lena Headey, Little Miss Sunshine, Fictional film, coca cola company, Switchfoot, Sub Focus, BARE, Shots! Shots! Shots! Shots! Shots!, Phil Collins, James Shields (baseball), FiveThirtyEight, NC State Wolfpack, Cat's Cradle, Dopapod, Classical liberalism, Ad Thomas Massie, Pigeons Playing Ping Pong, Welcome (2007 film), Lost Ark, Lego Indiana Jones, Godrej aer, Skill, The Beatles' roof, James Bond in film, Rhythm game, Switchfoot discography, Summer festival, Indiana Jones (franchise), Food and drink, Emerg for Cutie, Doctor P, Matt Kibbe, event, Personal digital assistant, M om, Argument, Paul McCartney's Unplugged Tour 1991, Sid, Progre s, Indiana Jones and the Dance of the Giants, Summer Live '09, Debs Movie, Rob Thomas (musician), Indiana Jones and the Seven Veils, (album), Mr. Bean, Artifex, Kid Cudi discography, Young America, Hobbies and activities, Lettuce o Starr, Frank Reynolds (It's re console, Aberdeen Washington, Student council, Foo Fighters disc, ock, Serengetee, jack Johnson, Indiana Jones, Indiana Jones and the hi, Indiana Jones and the Kingdom of the Crystal Skull, Jam anapanese band), Creedence Clearwater Revival, List of songs o Fighters, Discography, 300 eFingers, Abercrombie North (film), MOJOJOJO, Political cultu re for Fighting, Funk rock, Gary Dakota, Switchfoot: Live – EP, W ound, Essay, Harrison Ford, Johnson, Z (Aion album), 2-step g, Bishop Nehru, Nirvana discograph icts, Shay Carl, Infiniti Emerg-e, Zack Snyder, Indiana Jones and th atis, 300, Soft rock, Vitis, Safari (web browser), Obsessive–compul Vibram, British rock, Taqueria, Regular Show, Sports and outdoor Test (assessment), Frédéric Bastiat, George Harrison, Lotus, D, Cookout, Evan Longoria, Ideology, Wasting Light, The Beatles: Rock Band, Gas mask, Hong Kong English pop, Social philosophy, Stephen Hillenburg, Kenny, ייגל קולדה-קוקי

Figure 1. Student project, *i*.

A second major part of this first theme is that the for-profit nature of Facebook is responsible for an increased emphasis on shallow entertainment, and students in turn believed that this increases their own shallowness. One student explained their newly discovered understanding of this process:

What is emphasized and continually shown back to me in my ads is the shallowest part of what I value in my life and Facebook condones this, simply because they are getting profit from it. My personal, and often what I think of as private,

information is being taken and sold to many third-party organizations who in turn gain power and money from knowing all this information.

This perspective was also reflected in a student's critical intervention, which imagined what their obituary would look like if it were to be constructed using the information that Facebook has found most important about them (Figure 2).

Obituary
 "Our community has truly lost a great person who was passionate about Iron Maiden: Flight 666, Thank a Police officer, No Strings Attached (film), Cam Fowler, Carey Price, 7 Seconds Entertainment, Malcolm in the Middle, Sense, Keebler Company, Dough, List of Google Doodles in 2011, 2006 Tour de France, Hartford Whalers, Danny Elfman, and Internet slang."

Figure 2. Student project, *Facebook Obituary*.

A related theme emerged as part of our class discussion as well. As they developed a better understanding of how the News Feed algorithm works, students learned that Facebook is increasingly focusing on video, which has increased ad revenue and engagement rates for branded videos ([Facebook Video Statistics Everyone Needs To Know 2016](#)). This increasing focus on videos means Facebook users are now increasingly more likely to see professionally created videos by brands than they are to see personal and text-based updates from their friends in what might be understood as the becoming-TV of social media. For students, this change reflects the shallowness that students feel through their use of the service, and they are now able to see how this shift is driven by engagement rates aimed at profit.

Significantly, this theme also concretely demonstrates the importance of Rosi [Braidotti's \(2013\)](#) ethical emphasis on non-profit arrangements of intensities to escape capitalist capture of the subject. An important takeaway for the students was that the for-profit nature of the site artificially limited the ways in which they engaged with the site, thus narrowing their own actual and potential processes of subjectivation as well.

The second major theme that emerged from my analysis of student work was that it was difficult to re-shape Facebook's "first impression" of the users that was created when they began using the service. Though students struggled with finding the language to express their concerns, it was clear that this served as important anchor in their realization that there are limitations to the ways Facebook plays a role in their processes of subjectivation. After seeing the myriad of ways in which advertisers could target them earlier in the project, many students began to think that Facebook truly knew and understood them because it could know everything about them. However, in seeing how many of the ads topics were related to their early use of Facebook, many students began to question both how much Facebook knows and how well it can use the data it collects. From a theoretical standpoint, we might say that students began to realize that Facebook saw them more as Deleuzian ([Deleuze 1992](#)) dividuals, only needing to know small slices of things about them to serve up narrowly targeted ads. This is an important shift in understanding because it creates a space in which students are able to see themselves as having room to intervene in the processes of subjectivation associated with Facebook.

In practice, students saw that rather than evolving over time to highlight changing interests and habits, all of the data collected by Facebook over the course of many years seem to stick with users and continue to impact the advertising process. A student explained the problem in this way: "Facebook seems to have a good idea of 'me' from 2009–2012, as that is when I was using Facebook much more frequently. Now I am on Facebook much

less frequently, and find myself 'liking' far fewer pages". Those early likes, which for this student occurred while in middle school, have stuck with her account and continued to shape the advertisements she is receiving well into college. This use of data over a long time can also potentially explain why student opinions diverged on how much Facebook seems to know about them. Students who liked many Pages early in their early days of Facebook use but who no longer use Facebook in that manner were more likely to find that Facebook ads topics did not seem to "know" their current selves. On the other hand, for students who still actively engage with liking Facebook Pages, the ads topics have done a somewhat better job of "growing" with the students. The takeaway from this distinction is that the way one uses Facebook alters their subjectivation by the site. The limitation is that this is difficult to realize from one's own limited perspective. It is easy to assume that others are using and being subjectivated by Facebook in ways that are similar to our own uses and subjectivations without realizing that other uses are possible and occurring. Hearing others discuss their Facebook data in class opened up students' understanding of the diversity of uses available.

Despite several students feeling that Facebook's ad topics were still hung up on their time in middle school, the majority of students were taken aback and how well Facebook seemed to know them. For example, one student wrote that:

Looking at the data it seems that Facebook knows more about me than I am comfortable with. The question of 'What does Facebook seem not to know about' leaves me seemingly without an answer. I say this because it seems to have information on my whereabouts, shopping tendencies and general interest. The scariest part is that the data is/was being recorded without my knowledge or consent ... There should be a disclaimer to let the user know that information about them is being recorded by using the app.

In addition to highlighting the degree to which this student believes Facebook understands them, it also points to the ineffectiveness of notice and consent (Sylvia IV 2016; Barocas and Nissenbaum 2009; Cate and Mayer-Schönberger 2013). Facebook specifically acquires consent during the creation of an account: "By clicking Create Account, you agree to our Terms and that you have read our Data Policy, including our Cookie Use", (Facebook.Com 2017). Of course, most users do not read the Terms before they create their account and never take time to consider what data are being collected or how they are being used.

The final major theme to arise from my analysis was that many students felt empowered to make changes to the way that they use Facebook after developing a better understanding of how the site uses their data. In the artistic interventions, students struggled with how to portray their own processes of subjectivation, and were even more unsure about how to artistically represent their interventions. Despite these struggles, students nonetheless felt more empowered in their use Facebook, so it is worth exploring these projects in further detail to see the new processes of subjectivations that are created. Many students presented themselves creatively in the limited way that they now believed Facebook understood them.

One student imagined a birthday party that her father set up for her based solely on her Facebook ads topics. When they showed up, they were greeted with a zebra-print décor and performances by Ryan Sheckler and The Rifles. This was all highlighted by flash mob professional wrestler attacks throughout the party. Carbonated water and Arizona iced tea were the only beverages served. Further, she received an Aéropostale gift card, which was disappointing because she had not shopped there since middle school. Another student crafted a Tinder dating profile that was based on the way Facebook subjectivated him:

I am very interested in cats even though I don't own one, so if you have a dog but are not constantly thinking about cats I don't really see this working out. I love to look back at old groups that I use to be a part of and also love to be constantly reminded about them ... One last thing that I think you should know

about me is that I never feel nostalgic about anything and feel that the current form of anything is always the best it ever has been.

A third student created a video that portrayed her as if she were featured on an episode of MTV Cribs. The video emphasized an obsession with Stride gum, peas, and the song “Monster” by Lada Gaga. However, at the end of the video, the student reveals that she feels blasé about peas, hates stride gum, and had never heard “Monster” before, deriding the inaccuracy of her Facebook ads topics. Finally, one student invented an entirely new, though false version of themselves based on their ads topics and filmed a “Day-in-the-Life” vlog that featured this person. It highlighted the tensions surrounding an extremely conservative vegan whose favorite food is free-range celery. Their day concluded by watching *Info Wars* as depicted in Figure 3. The argument about subjectivation rising out of these projects focuses on the limited ability of Facebook to subjectivate the students in narrowly capitalistic terms.



Figure 3. Student project, *Conservative Vegan*.

Another series of projects could easily imagine visualizing their surroundings with the types of things that filled their ads topics. This was particularly true when the topics seemed to only include movies, music, and a few snack items (Figure 4).



Figure 4. Student project, *A Media Rich Environment*.

One student went so far as to add physical copies of relevant material in their room, and used the Processing language to create a layer of augmented reality. This augmented reality, as seen in Figure 5, allowed the user to explore the room using a spotlight and when they stumbled upon one of the ad topic associated items, the code would generate some type of interaction. Examples include a picture of Karl Marx that begins playing the Soviet Union national anthem, and a song by the Beach Boys linked to the verbalization

of the word “safari”. These could only be turned off by vocally telling the computer to “shut up”. Finally, one could find the student himself laying on the ground, with a copy of *The Communist Manifesto* resting over his face to explore the way that Facebook had subjectivated him as a radical left-wing activist.

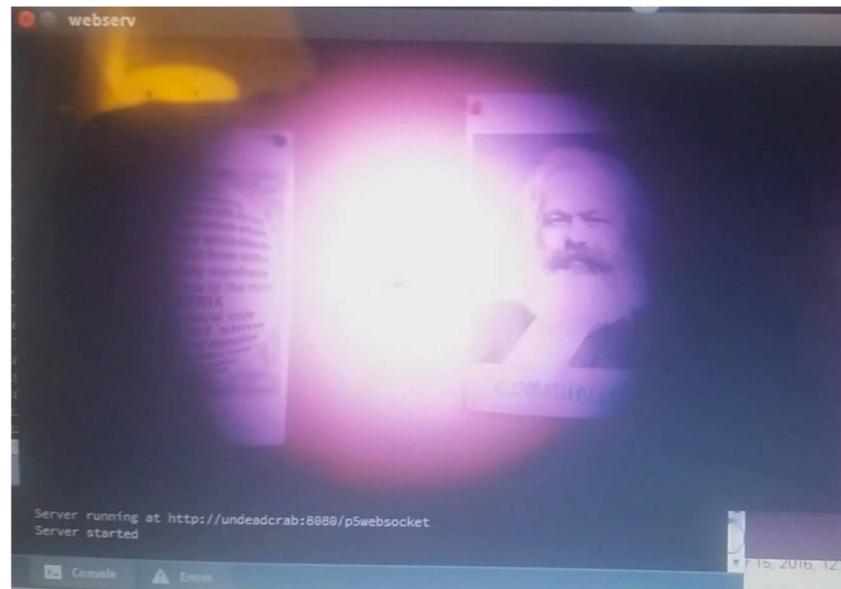


Figure 5. Student project, *Communist Trappings*.

These projects focused on the processes of subjectivation that occur through other media, such as games, songs, and books. Although Facebook subjectivates the students based on the media that they consume, it became clear to the students that it was not able to parse why they were consuming this media. For instance, some of the books that were read may be related to a course that the student was taking and not actually a personal interest.

Yet other students were more experimental in their approach. For example, one student created a new Facebook profile in order to see what ads topics would be associated with a new account. They entered only information about the school they attend, their major, a love for pizza, and uploaded photographs of zebras. This resulted in the following list of ads topics: Music theory, Zebra Print, WomenFreebies, pluto, CollegeInsider.com Postseason Tournament, Ford Thunderbird, Graphics Interchange Format, Obama sucks, All- news radio, Zebra, Taylor Swift discography, Southern Charm, Mellow Mushroom, Tosco Corporation, Appalachia Service Project, and Monopoly. This approach might be seen as following the recommendation by Galloway and Thacker ([Galloway and Thacker 2007](#)) to exploit networks in a way that generates false data and trolls social media algorithms. By critically and creatively intervening in these processes through their work, students were better equipped to understand how their use of the site contributed to the data that Facebook collected and make more informed decisions about how to use the service: “One major way that I decided to intervene with Facebook ads is to delete my Facebook account. While the decision to delete my Facebook wasn’t based off the project alone, it definitely helped me to make this move”. In addition to an extreme action such as deleting their account, students also reflected on ways of using the site less. These strategies involved narrowing usage patterns by for example, deciding to use the service only for photo sharing or only as a tool for chatting rather than posting updates.

This strategy of changing use patterns, specifically in deleting one’s account or using Facebook less, in some ways mirrors Gilles Deleuze’s ([Deleuze 1992](#)) strategy for the creation of vacuoles of non-communication. While Deleuze argues that this approach is beneficial because it reflects a process of creation rather than communication, such

an approach strikes me as problematic because it seems to be more closely associated with a reaction than a counter-actualization. While addressing this issue in class and at conferences, students and colleagues alike argued for the possibility of a new movement that promotes increasingly widespread vacuoles as a new politics of insurrection in relation to data surveillance. However, I argue that this is simply not feasible in contemporary society. We generate data by simply carrying a cell phone with us, having our license plate captured on camera while driving down the road, and in many more situations where we are simply going about our daily business. Making payments for our house or apartment generates data. If we make a purchase in a store, this is a datum that gets stored and correlated, even if it is a cash purchase that is not tied directly to an individual person. Even not being visible on social media itself becomes a data point, suggesting that we may have something to hide. For these reasons, a true vacuole of non-communication becomes increasingly impossible in the age of big data. Therefore, I tend to agree with the conclusions that my students reached: changing our use patterns for technology is an important first step in altering our processes of subjectivation. However, these changes are always experimental and rely on the media specificity of each particular site, so it is not possible to offer particular strategies that will work well for everyone across social media.

In answer to RQ1, I found that students developed a variety of ways to participate actively in their own processes of subjectivation related to Facebook. Most prominently these involved intentional changes in the way that students interacted with the platform. Increased knowledge about how the platform actually functions was an important precursor for taking such actions, highlighting the need for cartographic practices in understanding one's own position within a technological assemblage.

A clear theme emerged in answer to RQ2. Students felt that the for-profit nature of Facebook inherently limited their ability to participate actively in their processes of subjectivation. Even though there were many ways to change how one interacts with the site, this is mostly limited to using or not using existing features. Most importantly, even though they had access to the data and advertising interests which Facebook generates about them, students felt they had no way to intervene in this aspect of the platform. For example, even students who expressed a desire for well-targeted ads felt that they were relatively helpless in achieving this. Students felt it would be cumbersome to go back and "unlike" pages that they had liked when they were much younger, yet these likes still seemed to drive advertising that was being generated in their feeds. Additionally, some students noted the (intentional) shift away from personal interaction with people they have met in-person to an emphasis on Pages and Groups in their feeds. Although Facebook does offer some tools for curating the Newsfeed, these also felt cumbersome and were not easy for students to use despite some desire to do so. Therefore, rather than intervening by finding ways to curate their feeds, some instead opted to stop using the feed and focus only on the messaging feature which was more likely to be used by people they have met in-person. Therefore, Facebook's platform design and intentional algorithm updates were seen as significant limiting factors in the ability to intervene in processes of subjectivation.

In summary, students found that Facebook's processes of subjectivation were heavily shaped by the site's for-profit nature. This shaping extended past the ads themselves to the way that the content in the Newsfeed was displayed for the students, where much of their subjectivation took place in the form of consuming short, entertainment-heavy updates. Additionally, the site maintains and continues to prioritize the importance of Page Likes. This meant that the ads topics for many students who no longer use Facebook in this manner felt out of date in a way that made clear Facebook's limited ability to subjectivate students based only a few major types of interaction with the site, despite their vast rental of big databases. Finally, though students struggled to present this idea artistically, many were empowered once they began thinking about how a change in their own use habits would intervene in their processes of subjectivation connected to the big data associated with Facebook. In reviewing my students' conclusions, I believe that their analysis opens

up an even more important question: what would social networking look like if it were set up for nonprofit in the interest of the public good?

4. Discussion

From a pedagogical perspective, the results of this project were quite beneficial. Although I had previously taught about social media platforms, algorithms, and data, the personal nature of this assignment increased student engagement and led to the development of student projects that were personal, interesting, relevant, and deeply reflective. This approach allowed students to understand their own position within the larger assemblages of social networks in new and more personal ways than they would by reading articles and having discussions in class. By directly engaging with their own data, students were able to develop a deeper understanding of how they are impacted by the social and technical aspects of the Facebook platform. Analyzing student results for this same project, were it to be completed today, would likely lead to different outcomes. However, I argue that it is not the particular outcomes of the students' interventions themselves that are important in this case. Certainly, these outcomes speak to the state of Facebook at a particular moment in time, and might be useful for understanding that particular moment. More importantly, this assignment reflects a process which can be used to help students develop a deeper understanding of how their data are used and how they might intervene in those processes. This cartographic method and affirmative critical approach can be applied even as particular sites evolve over the years and new platforms are introduced. For example, it might be deployed to better help students understand the nature of TikTok's extremely successful use of algorithms.

Such an assignment has the potential to be used in a wide variety of courses and departments. As noted previously, this iteration of the assignment was deployed in both a lower-level communication course as well as an upper-level Science, Technology, and Society course. I have since incorporated the assignment into a graduate-level class developed an M.S. in Applied Communication program with a concentration in Social Media. I could envision the assignment being modified so that it could be adopted, for example, in introductory-level computer science courses covering algorithms or as a writing assignment for English composition courses.

One theme continually emerges from this assignment. In this particular iteration of the assignment, my students' interventions in their own processes of subjectivation revealed that Facebook's approaches to subjectivation all stem in one way or another from the for-profit nature of the site. This finding, in conjunction with Rosi Braidotti's emphasis on non-profit and open-source initiatives that we saw earlier, leads to the larger question of what social networking would look like if it were set up according to a nonprofit model. How would this alter the processes of subjectivation associated with that site? The social media website Ello offers an example of what social networking might look like if it were created for social good rather than profit at its core. This change begins at the very outset with a disruption to the traditional binary notice and consent model. Ello offers users the option to change permission settings to allow for the collection of either anonymous, aggregated data through Google Analytics *or* to completely opt-out of the use of Google Analytics, anonymous or otherwise ([Ello Privacy Policy 2015](#)). Importantly, even users who originally selected to share anonymous data have the option to revoke that sharing at any time and move to the opt-out model. This represents a first step away from a model of privacy and toward a more fluid relational model that returns the control of a (data)body's digital traces to itself.

Perhaps most importantly, Ello was incorporated as a Public Benefit Corporation with a legal mandate to never sell ads. Their manifesto reads, in part: "We believe a social network can be a tool for empowerment. Not a tool to deceive, coerce, and manipulate—but a place to connect, create, and celebrate life. You are not a product" ([Ello Manifesto 2014](#)). Ello generated significant attention and funding when it emerged as an alternative social networking space at the point when Facebook first required the use of one's legal

name (Fitts 2016). However, the site has since rebranded, using the slogan ‘The Creator’s Network.’ It is primarily targeted toward artists and other creators as a place to collaborate with others and sell their work. Although this might be read as a problem associated with creating a non-profit alternative to Facebook, it is worth noting that other for-profit social networking sites have also needed to brand themselves with a unique feature to find success. For example, Instagram initially focused exclusively on photos while Snapchat featured self-deleting communications, though both have subsequently explored new directions. In this sense, it is unclear whether Ello’s rebranding is a result of its being a nonprofit, or just another social networking site that needs its own spin to survive in light of Facebook’s continued success. One further distinction for the site is that in 2016, it also embraced an open source by default approach, in which their source code is shared freely via GitHub, a model that was also used in the early years of the social platform LiveJournal (Zeschin 2016; Wright 2019).

Yet, the question that immediately jumps to the forefront is how such a strategy can possibly be sustainable in the long run considering the expenses associated with keeping the service running. Mark Andrejevic has emphasized the importance of an infrastructure that does not rely on monetization through data collection or enforced scarcity, but would perhaps mirror public infrastructure such as NPR or BBC (Sylvia IV and Andrejevic 2016). For example, the site might rely on donations in the way that a large nonprofit site like Wikipedia does. However, Ello is attempting to forge a different path. First, the owners claimed that they would do this through selling premium features to interested users. However, this model still seems to be very much in flux. So far, Ello has started initiatives that raise money by selling limited edition Threadless t-shirts, partnering with print art magazines, and launching its own print magazine (Lopez 2014). Each of these efforts has featured user-generated content and has provided financial compensation for the use of the work.

Due to its narrowing focus on creators, this example offers only a limited glimpse in what a non-profit approach might look like for a more broadly defined social media service. Despite its relative lack of success, it none-the-less provides a vital starting point for extending this type of thinking in a space that has thus far been predominantly inhabited by for-profit ventures. In light of the challenges created to democratic systems by social media platforms, significant work has begun to try to develop new approaches to digital spaces that might serve the public and civic good. For example, New_Public is a group that “aims to inspire and connect designers and technologists to build more, flourishing digital public spaces”, (Purpose n.d.). These approaches can and should be explored further through further pedagogical action research. An extension of this assignment to actively imagine and/or design these non-profit and public-good approaches to social media would embrace both the ethos of posthuman counter-actualization as well as Freire’s call to intervene in real-world problems in order to achieve emancipation.

5. Conclusions

While Facebook continues to be the most popular social networking site, it is clear, based on discussions with students, that many are no longer satisfied with their use of the site, even as they continue using it. Much of this dissatisfaction is linked to the ways that Facebook uses data to subjectify its users. The path to profitability for other social media sites has also obscured the advertising and monetization models that underlie these efforts. For example, many sites raise a significant amount of startup funding and begin offering their services ad-free. It is only later that the advertising model develops and is added to the product. Twitter and Instagram both followed a model such as this, with Instagram later being purchased by Facebook. Therefore, to the casual user, it may not be immediately clear that Ello makes a distinction in its composition as a for public good organization.

One important contrast is that Facebook has well-established practices that have been tested to maximize profit. New and experimental social media sites are still exploring other possible practices that are not exclusively focused on profit. A posthuman nomadic ethics,

inspired by the philosophy of Baruch Spinoza, seeks to determine what a body can do through experimentation. This ethos can be seen in the experimentation with new forms of digital public spaces that are emerging. Future work could help students explore how other social network sites impact their processes of subjectivation and compare and contrast these results with those of Facebook. Such a goal is important pedagogically because it helps students better understand their own connections to social media, but it can also potentially offer some insight, despite the limitations of this particular study, into how different approaches to social media design might impact the processes of subjectivation of civic bodies at larger scales. Most importantly, this project is meant to offer an example of how one might take an affirmative approach to critical literacy pedagogy or critical digital literacy. The analysis of student work demonstrates its success in helping students think more clearly about how their data are used, counter-actualize that use through affirmative artistic interventions, and, based on analysis of those interventions, suggests how the assignment might be extended in the future to further help students explore new avenues for counter-actualization. These include re-imagining approaches to social media that incorporate non-profit approaches.

Funding: This research received no external funding.

Institutional Review Board Statement: The study received administrative review from the North Carolina State University Institutional Review Board (Protocol Code 9209, 16 August 2016) and was approved as exempt from the policy as outlined in the Code of Federal Regulations (Exemption: 46.101. Exempt b1).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy concerns related to the potential to de-anonymize social media data submitted by participants.

Conflicts of Interest: The author declares no conflict of interest.

References

- Abe, Paige, and Nickolas A. Jordan. 2013. Integrating Social Media Into the Classroom Curriculum. *About Campus* 18: 16–20. [CrossRef]
- Barge, J. Kevin, Jennifer Lyn Simpson, and Pamela Shockley-Zalabak. 2008. Introduction: Toward Purposeful and Practical Models of Engaged Scholarship. *Journal of Applied Communication Research* 36: 243–44. [CrossRef]
- Barocas, Susan, and Helen Nissenbaum. 2009. On Notice: The Trouble with Notice and Consent. Proceedings of the Engaging Data Forum: The First International Forum on the Application and Management of Personal Electronic Information (October). Available online: https://www.nyu.edu/projects/nissenbaum/papers/ED_SII_On_Notice.pdf (accessed on 3 July 2016).
- Bhargava, Rahul, Ricardo Kadouaki, Emily Bhargava, Guilherme Castro, and Catherine Dignazio. 2016. Data Murals: Using the Arts to Build Data Literacy. MIT Media Lab. Available online: <https://www.media.mit.edu/publications/data-murals-using-the-arts-to-build-data-literacy/> (accessed on 26 September 2021).
- boyd, danah. 2014. *It's Complicated: The Social Lives of Networked Teens*. 1. Aufl. New Haven: Yale University Press.
- boyd, danah. 2017. Did Media Literacy Backfire? *Points* (blog). Available online: <https://points.datasociety.net/did-media-literacy-backfire-7418c084d88d#py2u7bmx7> (accessed on 8 March 2017).
- boyd, danah. 2018. You Think You Want Media Literacy . . . Do You? *Medium*. March 16. Available online: <https://points.datasociety.net/you-think-you-want-media-literacy-do-you-7cad6af18ec2> (accessed on 25 January 2020).
- Braidotti, Rosi. 2013. *The Posthuman*. Cambridge and Malden: Polity Press.
- Brocato, E. Deanne, Nathan James White, Kenneth Bartkus, and Ashley Ann Brocato. 2015. Social Media and Marketing Education: A Review of Current Practices in Curriculum Development. *Journal of Marketing Education* 37: 76–87. [CrossRef]
- Cate, Fred H., and Viktor Mayer-Schönberger. 2013. Notice and Consent in a World of Big Data. *International Data Privacy Law* 3: 67–73. [CrossRef]
- Constine, Josh. 2011. Facebook Launches Ad Targeting by Topic. *Social Times*. Available online: <http://www.adweek.com/socialtimes/topic-ad-targeting/267288> (accessed on 29 January 2017).
- Deleuze, Gilles. 1969. *The Logic of Sense*. New York: Columbia University Press.
- Deleuze, Gilles. 1992. Postscript on the Societies of Control. *October* 59: 3–7.
- Deleuze, Gilles, and Félix Guattari. 1980. *A Thousand Plateaus: Capitalism and Schizophrenia*. Minneapolis: University of Minnesota Press.

- D'Ignazio, Catherine. 2017. Creative Data Literacy: Bridging the Gap between the Data-Haves and Data-Have Nots. *Information Design Journal* 23: 6–18. [CrossRef]
- Ello Manifesto. 2014. Ello. Available online: <https://ello.co/wtf/about/ello-manifesto/> (accessed on 27 June 2015).
- Ello Privacy Policy. 2015. Ello. Available online: <https://ello.co/wtf/policies/privacy-policy/> (accessed on 13 June 2015).
- Facebook Video Statistics Everyone Needs To Know. 2016. Media Kix. Available online: <http://mediakix.com/2016/08/facebook-video-statistics-everyone-needs-know/#gs.VZ1SJHU> (accessed on 29 January 2017).
- Facebook.Com. 2017. Facebook. Available online: <http://www.facebook.com> (accessed on 29 January 2017).
- Fitts, Alexis Sobel. 2016. The Bizarre Second Life of the Utopian 'Facebook Killer'. *Backchannel*. Available online: <https://backchannel.com/the-bizarre-second-life-of-the-utopian-facebook-killer-67f79ceb134e#xn3cgo8t2> (accessed on 29 January 2017).
- Freire, Paulo. 2000. *Pedagogy of the Oppressed, 30th Anniversary Edition*. Translated by Myra Bergman Ramos. New York: Continuum.
- Freire, Paulo. 2013. *Education for Critical Consciousness*. London and New York: Bloomsbury Academic.
- Galloway, Alexander R., and Eugene Thacker. 2007. *The Exploit: A Theory of Networks*. Electronic Mediations, v. 21. Minneapolis: University of Minnesota Press.
- Gretter, Sarah, and Aman Yadav. 2018. What Do Preservice Teachers Think about Teaching Media Literacy?: An Exploratory Study Using the Theory of Planned Behavior. *Journal of Media Literacy Education* 10: 104–23. [CrossRef]
- Hayles, N. Katherine. 2017. *Unthought: The Power of the Cognitive Nonconscious*, Illustrated Edition. Chicago and London: University of Chicago Press.
- Kim, Carolyn, and Karen Freberg. 2016. The State of Social Media Curriculum: Exploring Professional Expectations of Pedagogy and Practices to Equip the Next Generation of Professionals. *Journal of Public Relations Education* 2017: 2. Available online: <https://aejmc.us/jpre/2016/12/14/the-state-of-social-media-curriculum-exploring-professional-expectations-of-pedagogy-and-practices-to-equip-the-next-generation-of-professionals/> (accessed on 25 July 2021).
- LaGarde, Jennifer, and Darren Hudgins. 2018. *Fact vs. Fiction: Teaching Critical Thinking Skills in the Age of Fake News*, 1st ed. Portland: International Society for Technology in Education.
- Lindstrom, Denise, Denise Schmidt-Crawford, and Ann D. Thompson. 2016. New Literacies, Technology, and Teacher Beliefs: Still More Work to Do. *Journal of Digital Learning in Teacher Education* 32: 3–4. [CrossRef]
- Lopez, Napier. 2014. Ad-Free Social Network Ello Turns To Branded T-Shirts for Revenue. *The Next Web*. Available online: <https://thenextweb.com/insider/2014/11/18/ad-free-social-network-ello-turns-branded-t-shirts-revenue/> (accessed on 29 January 2017).
- Mackey, Thomas P., and Trudi E. Jacobson. 2014. *Metaliteracy: Reinventing Information Literacy to Empower Learners*. Chicago: ALA Neal-Schuman.
- Mackey, Thomas P., and Trudi E. Jacobson. 2017. Reframing Information Literacy as a Metaliteracy | Macke | College & Research Libraries. April. Available online: <https://doi.org/10.5860/crl-76r1> (accessed on 26 September 2021).
- Markham, Annette N. 2019. Critical Pedagogy as a Response to Datafication. *Qualitative Inquiry* 25: 754–60. [CrossRef]
- Niemi, Reetta. 2019. Five Approaches to Pedagogical Action Research. *Educational Action Research* 27: 651–66. [CrossRef]
- Oberg, Dianne, and Siri Ingvaldsen. 2016. *Media and Information Literacy in Higher Education: Educating the Educators*. Oxford: Elsevier Science & Technology, Available online: <http://ebookcentral.proquest.com/lib/fitchburg-ebooks/detail.action?docID=4746199> (accessed on 26 September 2021).
- Purpose. n.d. New_Public. Available online: <https://newpublic.org/purpose> (accessed on 25 July 2021).
- Reason, Peter, and Hilary Bradbury, eds. 2013. *The SAGE Handbook of Action Research: Participative Inquiry and Practice*, 2nd ed. London: SAGE.
- Summers, Christopher A., Robert W. Smith, and Rebecca Walker Reczek. 2016. An Audience of One: Behaviorally Targeted Ads as Implied Social Labels. *Journal of Consumer Research* 43: 156–78. [CrossRef]
- Sylvia IV, J. J. 2014. Using Bloom's Taxonomy to Assess Social Media Assignments. *Journal of Interdisciplinary Studies in Education* 3: 50–59.
- Sylvia IV, J. J. 2016. Little Brother: How Big Data Necessitates an Ethical Shift from Privacy to Power. In *Controversies in Digital Ethics*. Edited by Amber Davisson and Paul Booth. New York: Bloomsbury, pp. 13–28.
- Sylvia IV, J. J. 2021. Posthuman Media Studies. *Journal of Posthumanism* 2021: 1.
- Sylvia IV, J. J. 2022. Civic Engagement and Dialogic Approaches to Post-Truth in the Classroom. In *Pedagogies of Post-Truth*. Critical Communication Pedagogy. Lanham, Boulder, New York and London: Lexington Books, pp. 137–54.
- Sylvia IV, J. J., and Mark Andrejevic. 2016. The Future of Critique: Mark Andrejevic on Power/Knowledge and the Big Data-Driven Decline of Symbolic Efficiency. *International Journal of Communication* 10: 3230–40.
- Talib, Saman. 2018. Social Media Pedagogy: Applying an Interdisciplinary Approach to Teach Multimodal Critical Digital Literacy. *E-Learning and Digital Media* 15: 55–66. [CrossRef]
- Tandoc, Edson C., Jr., Andrew Z. H. Yee, Jeremy Ong, James Chong Boi Lee, Duan Xu, Zheng Han, Chew Chee Han Matthew, Janelle Shaina Hui Yi Ng, Cui Min Lim, Lydia Rui Jun Cheng, and et al. 2021. Developing a Perceived Social Media Literacy Scale: Evidence from Singapore. *International Journal of Communication* 15: 22.
- The Facebook Ads Benchmark Report. 2013. SalesforceSocial.Com. Available online: <http://www.salesforcemarketingcloud.com/wp-content/uploads/2013/06/The-Facebook-Ads-Benchmark-Report.pdf> (accessed on 29 January 2017).

-
- The News Literacy Project. n.d. Ten Questions for Fake News Detection. Available online: <http://newslit.org/sites/default/files/GO-TenQuestionsForFakeNewsFINAL.pdf> (accessed on 28 May 2019).
- Turkle, Sherry. 2011. *Alone Together: Why We Expect More from Technology and Less from Each Other*. Paperback First Published. New York: Basic Books.
- Wright, Steven. 2019. 'The Linux of Social Media'—How LiveJournal Pioneered (Then Lost) Blogging. *Ars Technica*. January 22. Available online: <https://arstechnica.com/gadgets/2019/01/the-linux-of-social-media-how-livejournal-pioneered-then-lost-web-blogging/> (accessed on 27 January 2021).
- Zeschin, Jay. 2016. Open Source by Default. *Ello*. Available online: <https://ello.co/jayzes/post/tqll-z8u8gfbdyrsk6wbkg> (accessed on 29 January 2021).