Teaching Critical Thinking about Media Technologies

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During the past few years, I have taught critical thinking about media technologies to first-year undergraduates—people notoriously dependent (perhaps stereotypically so) on their smartphones, MP3 players, and social media accounts. Although the course does not fit neatly into traditional academic departments, an initiative at the University of Georgia to boost the quality of the first-year student experience by creating small one-credit seminars gave me the room to teach it. My university is a large selective school. Students choose the required one-credit seminar based on interest, and come to the course with a wide range of degree plans and interests.

My course about media technologies takes a theoretical and historical view. Meetings in the first few weeks take up the theoretical component. In it, students explore common definitions and ways of thinking about media technologies. For the remainder of the semester, students conduct historical research using primary sources (largely newspapers and magazines) to investigate periods when media technologies were being introduced, initially publicized, and talked about. Searchable databases of digital facsimiles of historical newspapers and magazines facilitate this research. I learned the hard way the first time I taught the class how difficult it is for students to see the relevance of earlier times to their own, so I now address students' habitual views of media technology much more explicitly in the first few weeks. Doing so disinters deeply buried truisms so that students recognize and consider them. The goal of the class ultimately is not to enforce a view but to enable students to make critical thinking a common part not only of this class, but also in all realms of their lives.

Key Beliefs about Media Technology

A critical understanding of media technologies requires addressing three general beliefs. The first is what Raymond Williams has called "technological determinism," the belief that technologies are autonomous, independent causes of social change. This is the assumption that media technologies are solely devices which have specific uses inscribed into their design. Corollaries of this belief are that these devices are independent actors, separate from people, and that they have no history or development, but instead spring into being fully formed.

The second stubborn belief is that media technologies are used solely to transmit information, a perspective that James W. Carey calls a "transmission" view of communication—that messages are simply empty boxes filled with content that media send from one person to another (15-18). Given this belief, it is no surprise that much advertising as well as popular understanding of digital devices such as smartphones places great importance on speed (how much data they can transmit) and range (where they are able to transmit data).

The third belief about technologies is that they steadily get better through time. In writing about historical scholarship in general, Herbert Butterfield critiques this as a "whiggish" view, in that it assumes that history has a single direction, and that it is one of progressive improvement. Among those pointing out the fallacy of such a simple assumption is historian of science Thomas Kuhn, who replaces the view of scientific development as a steady, cumulative march toward greater knowledge with one that recovers the often drastic instances in which one "paradigm" of scientific explanation wholly replaces another. In writing about revolutionary era France, cultural historian Robert Darnton also notes that claims that today's media landscape is so much more complex and advanced wrongly perpetuate a "specious sense of a break with the past." He argues that "every age was an age of information, each in its own way" (1).

Of these three beliefs about media technologies, the most ingrained one and most important to address is technological determinism. To address it, I use a clip from a feature film from 1980, a viral video, and a trio of recent newspaper stories.

Popular culture accounts show people's dreams, fears, and hopes as well as disagreements about technologies, and they reveal how an accepted and generally held view emerges, one that fixes at least for a time what a media technology is and how it is used. Popular culture is a source of dominant ideas about media technologies (through advertising, for example) as well as a source of alternative, critical ideas about them. Examining the diversity of coexisting ideas about a seemingly single technology builds critical understanding.

This Teacher Must Be Crazy

Prior to the first class session, I ask students to view the opening four-minute clip (available on YouTube and elsewhere) from the South African film *The Gods Must Be Crazy*. The film imagines what happens when a modern technology suddenly appears in a traditional society, presented in a combination of documentary-style footage and voiceover narration. The film disturbs students' sense that technologies and their uses are fixed and obvious to anyone.

The film clip opens with a pilot flying a small plane over the Kalahari Desert. After finishing a bottle of Coca-Cola, he unthinkingly tosses the empty glass bottle out his airplane window. The bottle tumbles to earth,

to be noticed by a Xi, a man who apparently has no experience of the modern world. He taps the unbroken clear glass bottle with his fingernail and then with a stick. The third-person narration from Xi's point of view helps us sympathize with his experience. About the bottle's composition, the narrator intones, Xi "had never seen anything like this in his life. It looked like water, but it was harder than anything else in the world." About why it appeared and what its purpose was, the narrator states, Xi "wondered why the gods had sent this thing down to the earth." Through this combination of visuals and third-person voiceover narration, students can see that, from Xi's point of view, it would be logical to think this way.

The clip also helps students see that technologies are open ended. What a device does greatly depends on its users' choices. After Xi discovers the bottle, he takes it to his village, where others examine it. "It was the strangest and most beautiful thing they had ever seen," the narrator continues. Villagers find the bottle useful for a variety of tasks around the village, such as to cure leather thongs and snake skins. An elder discovers that blowing across its open end produces musical sounds. As the narrator intones, "every day they discovered a new use for the thing," such as printing circles on a headband by using the open end to pick up ink then transfer the ink by pressing it to a band of leather, rolling it over seeds and grains to crush them into meal, and using it to break apart large roots for cooking.

As the film scene plays out, students also see how technologies are not necessarily only benign or beneficial. The situation in the village rapidly deteriorates because, as the narrator states from villagers' collective point of view, "the gods had been careless. They had sent only one. And now for the first time in their lives here was a thing that could not be shared because there was only one of it." Its scarcity along with its convenience spawns problems in villagers' relations between each other. The narrator continues that "suddenly everybody needed it most of the time. A thing they had never needed before became a necessity. And unfamiliar emotions began to stir. A feeling of wanting to own and not wanting to share. And other new things came. Anger. Jealousy. Hate. And violence." Scenes of people grabbing the bottle from others to use it for themselves accompany the voiceover. An argument and struggle between a young man and woman over the bottle ensues, and the young man uses the bottle to hit the woman over the head. He is immediately surprised and ashamed of his action. He drops the bottle and falls to his knees to comfort her.

Witnessing all this, Xi grabs the bottle and throws it in the air to give it back to the gods, but it tumbles back to earth. He tries again, with the narrator voicing Xi's thoughts by saying "'You must be crazy to send us this thing—take it back!'" But it tumbles back to earth a second time, this time bonking the head of Xi's young daughter. Xi carries the bottle away from the village and buries it. That evening, the villagers sit around the fire, contemplative and quiet. As the narrator concludes, "a

strange feeling of shame had come over the family." As night falls, Xi thinks via the narrator, "'I have buried the thing. It will not make us unhappy again.'" But the mood of the villagers at the end of this clip is anything but happy.

I ask students to both view this clip before class and post to the class online discussion board their answers to the questions, "what is a technology?" and "what is the best way to study a technology?" Students typically answer that a technology is an object; that it makes daily tasks easier; and that technologies continually get better over time. Some students note that technologies can sometimes have negative effects, too, as when one student noted the "impact of the smartphone on communication skills and focusing capabilities among today's youth," but most emphasize benefits. Students typically assert that studying the object is the best means for studying a technology. Many answer in ways approving of the ingenuity they saw portrayed in the film, by suggesting that "tinkering with and exploring the technology" is the best way to find out what it can do.

These responses become an additional text for class discussion of the film. In discussion, students use the story of Xi, the villagers, and the Coke bottle as well as their own answers to reflect more generally on media technologies and more personally on their own habitual views about them. In small groups, students share the answers they posted on the online discussion board and then agree upon a set of group answers. After an initial flurry of discussion, the room quiets down noticeably: students feel the answers are obvious, and since they all have roughly the same answers they feel nothing further needs to be discussed.

I summarize the group reports on the board in front of the class, to highlight the commonalities and to point out that these beliefs are part of our general stock of knowledge. Through further discussion, we explore the inadequacy of these beliefs, first establishing that the use of a technology is not fixed either by the designer's intention or limited by the substance of the object, but rather composed of ideas and knowledge about its possible uses.

I ask students to name all the uses of the bottle shown in the film. Not only did the bottle perform all of these functions well, they see that none of the uses was what the bottle designer intended. To make a closer connection to students' own experience, I ask them to name possible uses of smartphones other than what they are designed for, the more outrageous the better, as long as they are physically plausible. Lists typically begin with doorstops and paperweights, then extend to more outlandish suggestions such as a teething bar for infants, a hockey puck, and a gerbil bridge. While the smartphone will work reasonably well for all these, none is what the designer intended. I then ask, what is the proper use? What is the true use? Is any use okay? Through discussion, students gradually understand the loose relationships between the designer's intentions and the ways a particular technology might be used.

Through this line of questioning, students see that the use of a technology is not inscribed indelibly into the object, but made possible by the specific object and also by ideas and knowledge about its possible uses. Possible and actual uses are often unintended and unforeseen. Students begin to see that technologies are not foreordained and fixed, but always in flux and determined by social knowledge and uses as much as by the physicality of the object.

Insights

To prepare for the second class session, students view a widely available eight-minute video titled *Sight*. This film was conceived and produced by student filmmakers Eran May-raz and Daniel Lazo for their art school graduation project. As the filmmakers describe it,

> At first we were set on making a film that had augmented reality in it. We did some research, delved into every kind of augmented tech out there today, and somewhere along the way we thought "Hey, I wonder how augmented reality would be…without the device or apparatus barrier. What if we could just SEE [in] augmented reality?" So we kind of tried to envision the world and how it would act after this kind of technology is standard, and it rolled on from there. (quoted in O'Dell)

The insights from *The Gods Must Be Crazy* are explored in more depth through this second video clip, which takes place in what appears to be the not-too-distant future. It starts with a young man lying on a rug in the middle of a sparsely furnished modernist room we take to be the living room of his apartment. Dressed in shorts and a t-shirt, he lies on his belly with his back unaccountably arched and legs and arms outstretched, rolling himself back and forth by shifting the position of his limbs. It is only when we see from what is presented as his view that he is playing an augmented-reality game titled Sky Hero. As he skims mountain tops and boulder-strewn gorges, the borders of his field of vision are peppered with videogame-like data, such as "Score: 600 (1000 pts to Silver)," "Difficulty: Hard," "Altitude: 166,794" and "Speed: 230 km/h." As he navigates his augmented reality flight through the air, we see markers whoosh past and hear game audio feedback such as "Good job!" "Excellent!" and "Well done!" as he collects points. When he "lands," winning 3,000 points and a "perfect" rating, he collapses on the floor, rolling over to reveal metallic-looking irises that we understand to be the means by which he engages Sky Hero without any external device.

We subsequently see him engage his mundane, everyday world through augmented reality without effort. When he opens his refrigerator he sees in his peripheral vision information about its temperature and the state of various foods in it. He follows food preparation and cooking directions that guide his actions down to placing the cucumber so that he can slice it according to a series of dotted lines (and as with Sky Hero,

with data readouts and scores as a videogame). While he eats, he watches commercial video programs simply by gazing at a wall. The walls of his apartment are alive with video data, powered solely by the devices embedded in his eyes. He sets up and prepares for a night out, with the video concluding with predictably dystopian results for his date.

This video underscores the social and cultural substance of technologies by exploding even more overtly the boundaries between technology and people. As *The Gods Must Be Crazy* film clip illustrates, technologies are not solely a matter of what they are made of but also a matter of how they are used and who uses them. The film *Sight* makes this insight even starker. The technology is not simply something to pick up and put down like a bottle (or a smartphone), it is literally an embedded part of the person.

Students post new answers on the online class discussion board to the same questions used for the previous meeting: "what is a technology?" and "how might we study the technology?" Some students' responses suggest how tenaciously they hold onto their habitual views, while others begin to see the inadequacies of common beliefs. One noted that technologies are not just objects, but they are their use together with the object. Another suggested that knowledge together with objects and uses forms a technology. Most, however, still answer that technologies are "any machinery or tool" and one that "promotes progress."

In class they again share in small groups their answers to these two questions, then craft group answers. Again, brief discussions ensue. They still hold to their beliefs that the answers are obvious, but this time students generally agree that technologies are composed in part by knowledge of how to use an object a certain way. Yet they still see the core of technologies as objects that people decide individually and for themselves how to use.

I bring up as an example the use of a stick for poking a hole in the ground into which a seed is dropped, and ask them whether the stick is a technology. Some argue that it is not, since the stick is simply something found naturally instead of made intentionally by high technology industries. Others argue that using the stick is indeed a technology, because it combines the object together with the knowledge and use. Through discussion, students begin to develop a position contrary to the object-centered view of technologies as simply a tool external from people. The critical insight concerns the objectification of technologies—that they are devices separate and independent from people. In the case of the video *Sight*, where is the line between the person and the technology? Students consider the fuzzy line between a person and a technology using other examples, with the category expanded beyond media technologies in order to make the point even starker. Tooth fillings? Prosthetics? Transplanted blood or organs? Vaccinations? Food? Air? Sunlight? Through this discussion, many students start to entertain the possibility that technologies are an intimate part of people and consequently have important physical, psychic, and social implications.

Media Technology in Process

Before the class's third meeting students apply the discussions and insights from the past two meetings and to a current situation in a short written assignment. They read three newspaper articles about a device for which an acknowledged use has not yet been determined. A recent version of the assignment focused on Google Glass, the prototype networked eyeglasses first introduced by Google in April 2012 that have a miniature camera, microphone, speaker, and computer attached to one eyepiece which can be operated by motions of the head, eyes, and fingertips.

Students write a short essay that proposes and substantiates a position regarding whether Google Glass currently is a complete and finished communications technology. They read Charles Arthur's article "Google Glass—Hands-On Review" which lists the device's individual capabilities—such as taking a picture or video, getting directions to a location, sending an email, making a phone call, or joining a video conference with other users. Arthur asserts that this is a device that does not yet have a compelling use. He speculates that Google Glass might be useful for people who need both hands free, such as surgeons, delivery drivers, or car mechanics. However, Arthur concludes that the device has little relevance for the rest of us. Rather than users shaping the device, "the tool tries to shape us," with the ultimate purpose simply keeping us "on Google at all times."

Students also read Stuart Dredge's "How Vice's Tim Pool Used Google Glass to Cover Istanbul Protests." It describes how journalist Tim Pool uses Google Glass for on-the-ground, live video newsgathering—what Pool calls "mobile first-person reporting"—in periods of social unrest in Istanbul, Cairo, and Brazil earlier in 2013. The article illustrates the beginnings of a generally acknowledged use for this device, but too early yet for this use to be generally recognized and accepted. Dredge notes with Pool that first-person reporting has been done prior to Google Glass, and that using Google Glass to capture action as it happens will not replace "journalists using their knowledge to explain what's happening and why." However, Pool describes Google Glass as a more effective device than, say, a video camera or smartphone. While witnessing street protests as they are happening, "when there's a wall of police firing plastic bullets at you, and you're running through a wall of tear gas, having your hands free to cover your face, while saying 'OK Glass, record a video,' makes that recording process a lot…easier." Additional capabilities such as chatting online with people while reporting, accessing files on his computer at home, and translating between Turkish and English while at the Istanbul event also extend reporting capabilities beyond video cameras and smartphones.

The students also read an article from an advertising industry newspaper, which assesses advertisers' and marketers' efforts to develop apps for Google Glass, similar to those available for smartphones that deliver a

branding or promotional message or experience (Delo). Examples of apps include one from an investment firm that delivers real-time stock index data and a "'recipe and meal preparation' app … that can search for recipes using keyword voice recognition and also read cooking instructions aloud." The article demonstrates, however, that Google Glass on its own does not constitute a full technology. The device and the apps do what they are designed to do, but none addresses a compelling social need. The larger challenge is finding a compelling need and use. As one marketer puts it, the task is "figuring out a way to make experiences for a wearable device useful and not merely replicating what a person could do on a smartphone" (Delo).

A few students who argue that Google Glass is currently a technology focus on the device and exclude any recognition of the importance of use. Such accounts simply recite all the device's individual technical capabilities (it can take a picture, record a video, and so on) while proposing a reduced definition of a media technology as simply that which, as one student put it, "transports information and ideas from one place to another." More typically, students argue that emergent technology—Google Glass, in the most recent case—is not a technology. They note the lack of "a practical social use" for Google Glass. One student explained that "Google Glass's main problem is the fact that there seems to be no real intended use for it, and no use has really been widely accepted." Other students draw a larger and more general claim about the social basis of use observing that "acceptance by society is what makes it a technology.[…] The product, in itself, will not accomplish this feat. It is what society does with the product that really matters. This potential comes from the possibility of what can be done through the glasses, not from the glasses themselves."

In class, students conduct an informal debate about Google Glass' status as a technology. Groups meet for ten minutes to develop a two-minute case substantiating their position, then present their case. Using reasoning developed through prior class discussion of material, students formulate arguments that claim that Google Glass is a technology. With this background, students have a way of investigating not just individual media technologies, but also the general social processes by which objects/devices of all kinds become media technologies. They investigate the emergence of specific media technologies and build an overall understanding of the social process by which this takes place. By the end of the semester, students have unearthed their received habits of thought about media technologies and held them up to critical reflection.

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