

THE BURSTING BOILER OF DIGITAL EDUCATION: CRITICAL PEDAGOGY AND PHILOSOPHY OF TECHNOLOGY

ANDREW FEENBERG

feenberg@sfu.ca

Simon Fraser University

PETAR JANDRIĆ

pjandric@tvz.hr

Zagreb University of Applied Sciences

ABSTRACT. This conversation explores the relationships between information technologies and education from the perspective of a Frankfurt School philosopher. The first part of the conversation provides a brief insight into distinct features of Andrew Feenberg’s philosophy of technology. It looks into lessons from “stabilized” technologies, explores the role of historical examples in contemporary technology studies, and shows that science fiction can be used as a suggestive inspiration for scientific inquiry. Looking at the current state of the art of philosophy of technology, it argues for the need for interdisciplinarity, and places Feenberg’s work in the wider context of Science and Technology Studies (STS). In the second part, the conversation moves on to explore the relationships between technology and democracy. Understood in terms of public participation, Feenberg’s view of democracy is much wider than standard electoral procedures, and reaches all the way to novel forms of socialism. Based on experiences with Herbert Marcuse in the 1968 May Events in Paris, Feenberg assesses the significance of information and communication technologies in the so-called “Internet revolutions” such as the Arab Spring, and, more generally, the epistemological position of the philosophy of technology. The last part of the conversation looks into the urgent question of the regulation of the Internet. It analyses the false dichotomy between online and offline revolutionary activities. It links Feenberg’s philosophy of technology with his engagement in online learning, and assesses its dominant technical codes. It questions what it means to be a radical educator in the age of the Internet, and asks whether illegal activities on the Internet such as downloading can be justified as a form of civil disobedience. Finally, the conversation identifies automating ideology as a constant threat to humanistic education, and calls for a sophisticated evaluation of the relationships between education and digital technologies.

Keywords: Frankfurt School; philosophy of technology; philosophy of Internet; Science and Technology Studies; Internet regulation; technical codes; stabilized technologies; Internet and democracy; Internet and socialism; Internet and social movements

Andrew Feenberg is a doyen of philosophy of technology and contemporary Frankfurt School Critical Theory. He was active in the New Left movement, studied philosophy under Herbert Marcuse (who, in turn, studied under Martin Heidegger), and strongly contributed to the development of online learning since early 1980s. In theory and practice, his work has made a contribution to shaping contemporary science and technology studies. At present, Andrew's work can be divided in four main streams. The first stream is concerned with philosophical understanding of technology as a social phenomenon. The second stream consists of various case studies on technology and social change. The third stream inquiries into digital education and ways of improving user experience. The fourth stream concerns the intellectual history of Western Marxism. On that basis, Andrew's work can be defined as the true critical philosophy of praxis.

During his rich academic career, Andrew worked at San Diego State University, Duke University, the State University of New York at Buffalo, the Universities of California, San Diego and Irvine, the Sorbonne, the University of Paris-Dauphine, the Ecole des Hautes Etudes en Sciences Sociales, the University of Tokyo and the University of Brasilia. Currently, he is Directeur de Programme at the College Internationale de Philosophie for the period 2013–2019, and Canada Research Chair in Philosophy of Technology in the School of Communication, Simon Fraser University.

Andrew authored numerous articles and classical books in philosophy of technology, including *Critical Theory of Technology* (Oxford University Press, 1991) (a second edition was published in 2002 under the title *Transforming Technology*), *Alternative Modernity* (University of California Press, 1995), *Questioning Technology* (Routledge, 1999), and *Between Reason and Experience: Essays in Technology and Modernity* (MIT Press, 2010). His latest book, *The Philosophy of Praxis: Marx, Lukács and The Frankfurt School* (Verso, 2014a), has been published less than a month before this conversation. As a co-editor, Andrew produced important texts such as *Marcuse: Critical Theory and the Promise of Utopia* (with R. Pippin and C. Webel) (Bergin and Garvey Press, 1987), *Technology and the Politics of Knowledge* (with A. Hannay) (Indiana University Press, 1995), *Modernity and Technology* (with T. Misa and P. Breij) (MIT Press, 2003), *When Poetry Ruled the Streets: The May Events of 1968* (with J. Freedman) (SUNY, 2002), *Community in the Digital Age* (with D. Barney) (Rowman and Littlefield, 2004), *(Re)inventing the Internet: Critical Case Studies* (with N. Friesen) (Sense, 2012). Andrew's writings have been translated in Japanese, Chinese, Italian, French, Norwegian, Turkish, Portuguese and Spanish.

In this article, Andrew Feenberg discusses his ideas with Petar Jandrić. Petar is an educator, researcher and activist. He published three books, several dozens of scholarly articles and chapters, and numerous popular articles.

Petar's books have been published in Croatian, English and Serbian. He regularly participates in national and international educational projects and policy initiatives. Petar's background is in physics, education and information science, and his research interests are situated at the post-disciplinary intersections between technologies, pedagogies and the society. Petar worked at Croatian Academic and Research Network, University of Edinburgh, Glasgow School of Art, and University of East London. At present he works as professor and director of BSc (Informatics) program at the Zagreb University of Applied Sciences, and visiting associate professor at the University of Zagreb.

Petar Jandrić: Andrew, it is a true honor to engage in this conversation with you! A decade ago, in an interview with Roy Christopher, you said:

The main difference [between you and other philosophers of technologies] is my background in Frankfurt School Critical Theory. I seem to be the only person trying to synthesize that tradition and contemporary technology studies. This leads me in a rather different direction than most of my colleagues, some of whom rely more on Heidegger, others on Dewey or democratic political theory. (Christopher, 2004)

Could you please tell us more about the distinct features of your philosophy of technologies? Which messages from Frankfurt School of Social Research are still relevant in our network society?

Andrew Feenberg: The Frankfurt School responded to the failure of the European revolutions after World War I and the rise of fascism by attempting to understand the effectiveness of consumerism and the mass media in controlling consciousness. These are still the principle mechanisms integrating advanced societies. The "network society" has changed many things but it has not changed this so the Frankfurt School is still relevant. Theories of the network society polarize around claims that it subverts social hierarchy through free horizontal communication vs. claims that it reinforces capitalism and the state through commercialism and surveillance. Both these claims are right and that is the paradox of this stage of its development. The Internet will surely change in the future, but we do not know in which direction. The Frankfurt School argued for a dialectical standpoint on society that recognized not only empirical facts but also potentials. We can apply this approach to the Internet to understand its ambiguous reality.

PJ: In the introduction to *(Re)inventing the Internet: Critical Case Studies* (Feenberg & Friesen, 2012), your analysis starts from the current state of the art of information and communication technologies:

Technologies normally stabilize after an initial period during which many differing configurations compete. Once stabilized, their social and political implications finally become clear. But despite decades of development, the Internet remains in flux as innovative usages continue to appear. The nature of the network is still in question. (Feenberg, 2012: 3)

Which lessons from “stabilized” technologies can we take into the context of information and communication technologies? More generally, what is the role of historical examples in our studies of contemporary technology?

AF: Stabilization is the result of the decline of interest in alternative designs. Often commercial forces play a role in focusing attention and demand on a single dominant design as in cases such as the triumph of electric refrigerators over gas refrigerators or VHS over Beta. Sometimes very different purposes can be combined in a single design that combines elements of several alternatives. This is so far the pattern of the Internet, but it is unstable because the commercial actors are not content with the outcome and are, furthermore, divided among themselves. The Internet today combines free communication as well as the distribution of information and goods, competing purposes to which correspond different optimal designs. The struggle over how best to serve these multiple purposes keeps the Internet in a state of suspense. The reasons why this case differs from the examples I have cited is the establishment of an influential culture among hundreds of millions of users. It is difficult politically to alter the design to which users have grown accustomed. There is really no precedent for this situation and no way to foresee the outcome.

PJ: Critical theories of technologies are often illustrated, and probably also inspired, by stories and images developed in imagined worlds of (science) fiction. Sometimes, these stories are dystopian (i.e. Orwell’s *1984* (1949) and Huxley’s *Brave New World* (1932)), sometimes they are utopian (i.e. Bellamy’s *Looking Backward: 2000–1887* (1888)), and sometimes they are situated between these extremes. In the third chapter of *Between Reason and Experience: Essays in Technology and Modernity* (Feenberg, 2010), entitled “Looking Forward, Looking Backward: The Changing Image of Technology,” you use the aforementioned works of fiction as a starting point for analysis of the contemporary Internet. Could you please generalize that research approach, and examine the impact of fictional accounts on philosophy and sociology of technology? What are the theoretical opportunities and limitations for using these fictional insights in the discourse of science?

AF: Science fiction has anticipated many inventions. Jules Verne imagined submarines and space travel. During World War II, the FBI interrogated a science fiction writer whose stories included an atom bomb not unlike the one actually under development in top secret laboratories. The Internet is

anticipated in Phillip K. Dick's story *Ubik* (1969), although in that story all the characters are actually dead. Despite these remarkable anticipations, I do not think science fiction can be more than a suggestive inspiration. It is not itself a theory, and when it is taken literally as such, one ends up with hype or fear-mongering. Both are illustrated nicely by artificial intelligence and nanotechnology, two fields that have been constructed around what are basically fictional promises that will never be fulfilled. In the essay to which you refer, I use science fiction to pose a problem. The contrast between utopian and dystopian fiction suggests that in the 50 years between the last great example of the former and the first classic example of the latter, something fundamental changed. I investigate that change.

PJ: In a recent interview with Laureano Ralón, you responded to Albert Borgmann's question whether the philosophy of technology has been recognized by North American mainstream philosophers by saying: "I do not think philosophy of technology has broken through. The reason is primarily the intolerance of analytic philosophers" (Ralón, 2010). In Jan van Dijk's (1999) and Manuel Castells' network society, where "the Internet is the fabric of our lives" (Castells, 2001: 1), this seems like a fairly reductionist position. What, in your opinion, are the main reasons for the described ignoring and / or intolerance between traditional philosophy and technology? Is it possible, perhaps, that information and communication technologies have changed the existing notion of disciplinarity?

AF: I stand by my response to Ralón. A more open philosophical community in the Anglo-Saxon world would have integrated philosophy of technology long ago, so obviously important is the subject matter in a society like ours. But the dominant trends in philosophy perpetuate themselves very much in isolation from reality. I cannot answer your more general question beyond repeating banalities about the power of institutionally established fields to police their boundaries. It is true that disciplinarity is challenged in new ways today but I would rate the problems of the environment higher than the Internet in inspiring the change. Climate science, for example, must draw on many fields because its object was not among those originally constructed in the definition of the various disciplines in the 19th century. The Internet, like the whole field of communication, is a latecomer and it too is not an object of a single established discipline. Interdisciplinarity is essential in such fields for this historical reason.

PJ: In *Technics and Time, 1: The Fault of Epimetheus* (1998), Bernard Stiegler analyses ancient distinctions between *technê* and *epistêmê*, and claims that the conflict between these two concepts is the essence of technics. However, as technics has entered all aspects of our contemporary lives, *technê* and *epistêmê* have been blended in the concept of technoscience. On that basis, he concludes that

[s]cience is then no longer that in which industry invests, but what is financed by industry to open new possibilities of investments and profits. Because to invest is to anticipate; in such a situation, reality belongs already to the past. The conjugation of technology, of science and of the mobility of capital, orders the opening of a future explored systematically by experimentation. This science become technoscience is less what describes reality than what it destabilizes radically. Technical science no longer says what is the case (the ‘law’ of life): it creates a new reality. (Stiegler, 2007: 32)

According to Roberts, while your social “constructivism would like to see technology as a subset of the cultural artefact and not vice versa”, Stiegler’s theory starts from opposite direction and seeks “understanding culture and society in terms of or as technical objects” (2012: 8). What can we learn from such reversal, and from the concept of technoscience?

AF: This is a complicated question. It is true that culture is unthinkable without technical artefacts but I don’t think it right to consider all cultural achievements technical in any meaningful sense. That would incline us to treat language as a tool, but clearly it is far more than a tool. It reveals and orders reality at a deeper level than any tool. The risk in stretching the word to include language is that that deeper level becomes invisible in the focus on utilitarian aspects. I am not sure Roberts has the correct interpretation of Bernard’s thought, but if he does then we find ourselves in a rare disagreement. As for technoscience, I can see the usefulness of the term to describe many fields of contemporary science which are engaged from the outset in technical and often even blatantly commercial projects. This describes a lot of biology. However, the logic of scientific institutions has not yet been completely overtaken by commerce, and fortunately so. As Lyotard pointed out in his book *The Postmodern Condition* (1984), science aims at novelty rather than efficiency. Where the two coincide, hurrah, but where efficiency is narrowly interpreted as the profitability of particular products and enterprises, watch out, there is a distinct possibility of corruption. So, difficult though it may be to work out all these relationships, we need to do so in order to protect our access to knowledge that is inconvenient for the powers that be.

PJ: Almost two decades ago, you identified tensions between Science and Technology Studies (STS) and critical philosophy of technology, and offered a way of “bridging the gap between the two fields through a synthesis of their main contributions” (2003: 73). A few years later, Jeff Kochan analyzed your book *Heidegger and Marcuse: The catastrophe and redemption of history* (2005), and arrived at the conclusion that “under the present circumstances, Feenberg cannot be co-opted into STS. But the cause is not yet lost. There is still a way in which Feenberg might meet STS halfway along his

proposed bridge” (Kochan, 2006: 717). What are the main differences between your work and STS? Has the time to build the proposed conceptual bridge finally arrived?

AF: I debated Kochan in the pages of the journal where he wrote these words and I think I got the better of the debate, although my judgment in this matter may be questionable. At the time we debated the issues, STS was still very hesitant to address policy issues. Kochan thought I was too political to be admitted to the club. The main actors were following what Wiebe Bijker called “the academic detour” (1996) to establishing a respectable discipline in the university. I recall that at the time Langdon Winner wrote an article entitled “Upon Opening the Black Box and Finding It Empty: Social Constructivism and the Philosophy of Technology” (1993), the black box in question being STS. I considered the apolitical stance of STS as something to engage with and I think this has proven right. The younger generation has been touched by issues such as climate change and debates over medical technology. The issues of the main STS journal read very differently today as a result. This is not to say that the founders have been repudiated. On the contrary, many of them have begun to write about controversial fields. Bruno Latour, for example, has become an advocate on the issue of climate change. My impression is that the whole field has shifted as the political environment has changed. I do not feel like a complete alien at STS meetings. There was even a panel on my work at the last 4S meeting in Buenos Aires.

This is not a Mimeo Revolution

PJ: An important part of your work is dedicated to the relationships between technology and democracy. Based on rejection of technological determinism, you argue that “nonessentialist philosophy paves the way for a democratization of technology, and indeed, a radical democratization of society itself” (Doppelt, 2006: 87). Could you please clarify the links between technology and democracy? The Internet is a pretty anarchic medium in its own right. Why, for instance, instead of a democratization, would it not lead to an anarchy?

AF: I don’t think anarchy is in the running. It is so obviously impractical. I use the term “democracy” to signify public participation. Thus I do not identify it with the existing electoral system but extend it to include any form of participation, including occupations, demonstrations, boycotts, lawsuits, hacking, and so on. I first developed this idea in the context of work on medical experimentation on human subjects (Feenberg, 1995: Ch. 5). In the case of AIDS it became clear that some of the interests of scientists and patients were different, if not conflicting. AIDS patients insisted on participation in determining experimental designs. This was a turning point in the practice of clinical research. I see in this a model of the fruitful interaction

between lay publics and scientific-technical disciplines necessary to manage technology in an advanced society. This is a different kind of democratization from elections, to be sure, but it seems to me to be the way in which the public sphere can be enlarged to encompass technology in societies completely structured around technical systems.

PJ: Nowadays, the question concerning technology often translates into the question concerning the environment. In *Democratizing Technology* (Veak, 2006), Andrew Light interprets your main environmental argument as follows:

Feenberg's basic idea on the relationship between the environment and technology is that environmental issues will help to press the necessity of the democratic reform of technology. In turn, a more democratically oriented technology will produce greener technologies, which will be better for the environment. (Light, 2006: 145)

If you allow me to play devil's advocate once more, could a democratic reform of technology, conceived within the present climate of global neoliberal capitalism, decide to go against your prediction and take the right turn: instead of producing greener technologies, could it not just orientate towards more profitable technologies regardless their environmental impact?

AF: Democracy is a procedure, not a policy. It is always possible that a democratic election grant power to a Hitler. In the case of the environment the question turns on how the individuals interpret their self-interest. If they remain narrowly focused on the immediate future, they may well vote for candidates who trash the planet. But there is reason to hope that a longer term perspective will prevail in the face of catastrophic warnings such as the great storms of the last few years. Such a perspective seems to be excluded in the corporate world by the narrow time horizons of markets. The imposition of a rational policy will therefore require regulations that only a democratic public is likely to impose.

PJ: In several writings, including *Between Reason and Experience: Essays in Technology and Modernity* (Feenberg, 2010: 28), you draw links between democracy and socialism. Could you please elaborate this relationship?

AF: Socialism as Marx and Engels understood it extended the democratic principle from the state to the economy. Their reason was simple: the economy controls human life as much or more than the state and so should be subject to control by those it controls. That is democracy in a nutshell. When Marx and Engels were writing most of the technology was in factories. It assembled lower class people in ways that made them potentially powerful. The whole theory of socialism was based on this situation. But today technology is not only in factories, it is everywhere. Democratic initiatives take many different forms in relation to this disseminated technological framework. If these initiatives became conscious of their commonalities, they would confront the issues that inspired the socialist movement in an earlier period.

PJ: With Herbert Marcuse, you actively contributed to the 1968 student uprising in France. Many years later, with Jim Freedman, you co-authored the book *When poetry ruled the streets: The French May Events of 1968* (2001). It is not too far-fetched to say that ideas and practices from 1968 have shaped the contemporary left. Nowadays, however, we live in a very different technological environment from Jan van Dijk's mass society (1999) characterized by one-way media such as television and radio. Could you please assess the role of technologies in the events of 1968? Which lessons can be taken for (the role of the Internet in) today's social movements? If I am not asking too much, could you perhaps draw a parallel between Paris in 1968 and recent "Internet revolutions" such as the Arab Spring?

AF: The May Events took place in a society dominated by broadcast television, but it was also a society in which traditional opinion makers such as the Communist Party still played a significant role. The idea of socialism was familiar and favorably viewed by millions of people who also enjoyed crude dubbing of American serials on TV. The technical environment was a strange mixture of the latest technology and traditional manufacturing. My generation was what Godard called the "children of Marx and Coca Cola" (1966). This ideological complexity goes a long way toward explaining the possibility of the May Events. In practice, we had very limited communicational technologies compared with social movements today. Mimeographed leaflets were the primary means of communication at our disposal. I have placed a huge collection of printed matter from the Events on my web site (<http://edocs.lib.sfu.ca/projects/mai68/>). You can see there our equivalent of Facebook and Twitter. Yet no one called our movement a Mimeo Revolution! Communication technologies do not make revolutions today any more than in 1968. But the availability of cheap printing in 1968 was important for the movement as is free communication on the Internet today. The dynamics produced by these communication technologies deserve to be studied, but without exaggeration.

PJ: The question about May events has probably touched upon some emotional memories from your youth. As a critical theorist, certainly, you are not expected to be "neutral" in the same sense as analytic philosophers, physicists or biologists. Actually, one of the main features of critical theory is recognition of one's own position in the world, and within one's own research. What is the influence of your personal beliefs and experiences on your philosophy of technology? Are you a philosopher of all technologies, or a philosopher of technologies available in late 20th and early 21st century?

AF: Everyone who thinks is situated at the intersection of their biography and the tradition within which they formulate their thoughts. This includes even analytic philosophers, especially them! So neutrality is truly impossible. My father was a theoretical physicist and I grew up hanging around his lab. I

was introduced to cyclotrons and nuclear power plants as a child and spent most of my adolescence absorbed in the study of chemistry. When my interests changed and I moved on to philosophy in college I was exposed to intellectual traditions critical of science and technology. I studied phenomenology, Heidegger, Lukács, Western Marxism. I did my Ph.D. with Marcuse. But in the late 1970s I began to work with research institutes in medicine and computing and gained much more experience with actual technology. My work on a critical theory of technology is an attempt to synthesize what I learned from the philosophy I studied with what I learned from working with technology.

The technical codes of online education

PJ: In *Between Reason and Experience: Essays in Technology and Modernity* (Feenberg, 2010), you introduce the concept of technical codes using the example of “bursting boilers” on steamboats in early nineteenth-century America. Your example clearly shows that the competing social forces – boiler makers and steamboat owners who wanted to maximize profit, and members of the public who wanted safer journeys – could not agree upon boiler safety standards without a third-party regulator (the Government). At the beginning of the 21st century, the Internet is roughly in the same stage as early nineteenth-century boilers. By and large, it is a fairly unsafe place, which is either unregulated (such as Internet pornography) or regulated without much success (such as sharing of copyrighted content). Based on the example of “bursting boilers,” do you think that the contemporary Internet requires more or less regulation than it has today? Why?

AF: A very interesting analogy! But of course there are differences. The only benefit of unregulated boilers was slightly lower ticket prices. The cost was human lives. In the case of the Internet the benefit of loose regulation is a more democratic society and the cost is primarily measured in inconvenience and wasted time, unless, that is, one considers pornography a major issue. Effective control of the Internet by regulators would require major changes with undesirable consequences. I’d rather put up with spam and viruses. Some regulation is, however, necessary to prevent intermediaries such as Internet Service Providers and search engines such as Google from manipulating the system to the advantage of their commercial interests. But this can be done by a vigorous enforcement of network neutrality, the principle according to which all data flows are treated equally. This is currently a subject of hot dispute in the U.S. where the basic decisions are still made.

PJ: On that basis, one could conclude that the struggle for Internet freedoms is one of the major fronts of contemporary struggles for a more just society, and that people such as Julian Assange and Edward Snowden have stepped

into the shoes of twentieth century dissidents and revolutionaries. However, it could also be a very powerful means for keeping masses off the streets. Could you please assess the importance of digital technologies for our social arrangements? Has the struggle for a better world really gone online, or is this just another strategy of pacification?

AF: The dichotomy suggested by your question is the wrong way to think about this. Malcolm Gladwell wrote an article for the *New Yorker* (2010) in which he makes the silly comparison between the courage of black students sitting in at lunch counters in the South during the Civil Rights Movement, and the triviality of signing an online petition. Well, obviously! But this is a case of comparing incomparable things. The only reason it would occur to anyone to make this comparison is even sillier claims that the revolution is now in cyberspace. Let's forget about all this hype and counter-hype for a moment. The reality is much simpler. All revolutions use communication technology. Lenin praised the telephone as a powerful instrument of revolution. As I mentioned, we used mimeo machines in 1968. Khomeini used cassette tapes. There are several special things about the Internet as a communication technology, such as its ability to host confidential discussion groups and to broadcast widely and rapidly, but there is no reason to claim that it is other than a communication technology, replacing telephones, cassette tapes and mimeo machines. As for the power of the Internet to depoliticize the masses, I am totally skeptical. Compare the impact of the Internet with the destruction of the labor movement, the success of neo-liberal ideology, the disappearance of a socialist alternative and the failure of social democratic parties to defend the welfare state, the total and perfectly legal corruption of the United States government, the leading nation in many fields. Why pick on the Internet? Really? (Feenberg, 2014b)

PJ: Since early 1980s, you have been actively engaged in the development of online learning (Feenberg, 1993; Hamilton & Feenberg, 2012). Could you please outline the main links between your philosophy of technology and your engagement in online learning?

AF: My philosophy of technology is based on the idea that technology forms the background and framework of our lives today. Its design and deployment ought therefore to be the object of conscious public decisions aimed at privileging democratic and human values. In actuality, most decisions are made behind the back of the public by the military and corporations. Sometimes this leads to conflicts, for example, around issues such as pollution. In the case of online education a clear pattern of abuse has emerged which should be resisted. I was there when we created the first online education program in 1982 (Feenberg, 1993). Our goal was to add human communication to distance learning. We created what would now be called web forums in which students could communicate with each other and their professors. I

see this as an appropriation of the network for humane purposes, in this case traditional educational goals. Today we are confronted with attempts to substitute the network for human communication, exactly the opposite of the original plan and the accompanying technical designs. The dream of automating education is part of an industrial trajectory that has deskilled and automated manufacturing and certain types of services. That it should be extended to education is an abomination. Money might be saved, although even that is uncertain, but at the expense of generations of children who should have a right to be taught by human beings rather than drilled by machines.

PJ: How have the attempts of an appropriation of the network for humane purposes transformed into their opposite? Could you perhaps analyze the underlying power dynamics?

AF: The commodity form and its administrative simulacra are now able to penetrate hitherto protected zones. This is the essence of neo-liberalism, the extension of commercial relations and criteria into every area of life. Education is a major expense and it is largely controlled by professionals. Deskilling education and bringing it under central management is now on the agenda. Money would be saved and the “product” standardized. Technology is hyped as the key to this neo-liberal transformation of education. Computer companies, governments, university administrations have formed an alliance around this utopian, or rather dystopian, promise. Online education is the victim of this powerful alliance. Academic professionals have been relatively ineffectual in saving our original design perhaps because they cannot easily reduce class sizes to make active participation in forums with students manageable. Such participation is time consuming and managing a forum with 30 or 40 students prohibitively so. But no one is suggesting that the money saved by online education be used to reduce class sizes. On the contrary, the latest fad is MOOCS with thousands of students in the class.

PJ: During my preparations for this conversation, McKenzie Wark recommended a film about Marcuse’s radical engagement during late 1960s and early 1970s entitled *Herbert’s Hippopotamus* (Juutilainen, 1996). As somebody who entered the field of critical theory after Marcuse’s death I found the film very interesting, as it reveals the person behind his philosophy. Marcuse’s political engagement was clearly a product of its time and technological ecosystem. As Marcuse’s student and contemporary philosopher of technology, you have been engaged in radical activities for many decades. What has changed with the advent of the computer? What does it mean to be a radical educator in the age of the Internet?

AF: I know that film. I am interviewed in it. I like it very much. The only thing I regret is that the explanations of Marcuse’s philosophy offered by the people interviewed ended up on the cutting room floor. I did a presentation where I tried to make up for that (<http://www.youtube.com/watch?v=nFbyp>)

Ir4RmQ). As for the impact of the computer, I do not see it as so very transformative yet although that may change. The Left movements we created in the 1960s died from internal dissension and repression before the Internet was opened to the public. The Internet entered a largely depoliticized public sphere and provided new possibilities for political communication, but the organizational capacity and will of the American Left was broken by then. It has not revived, witness the void left by the Occupy Movement. The main contribution of the Internet is not yet fully appreciated. That is the easy ability to form discussion groups around every kind of issue. Patient groups are an example. They have considerable political potential. For me as an educator the main change the Internet has brought is facilitating an international presence. I am able to lecture all over the world now because my work is known from my homepage and I can easily communicate with interested readers wherever they are.

PJ: In the film, Marcuse justifies using civil disobedience against violent forms of oppression. In the digital worlds of the Internet, of course, physical acts of violence such as breaking library doors are impossible. However, it is perfectly possible – and often very easy – to break rules and laws without consequences. For instance, already a minimal understanding of the Internet enables activities such as copyright infringement by downloading illegal content. Using Marcuse’s line of reasoning, can these activities be justified as a form of civil disobedience? Could you please analyze the thin line between the legal and the political? Are people such as Julian Assange and Edward Snowden criminals or political activists?

AF: This is a really difficult question. Illegal downloading cannot be compared to civil disobedience. It is an activity motivated by personal self-interest. That doesn’t mean it’s bad, but it is surely not primarily political. Kids just want to hear the music! Nevertheless there are political implications. The corrupt businesses that manage performers and treat them like garbage unless they are super-stars have been brought down a notch. Their control of distribution and the celebrity culture they foster are evils that could potentially be eliminated by the Internet. So far it has not happened, but one can always hope. On the other hand, Assange and Snowden are heroes. I am sure Marcuse would have celebrated their actions.

PJ: Information and communication technologies can support almost all traditional pedagogies: behaviorism, cognitivism, constructivism... Controlled and monitored technologies downgrade traditional academic freedoms by transferring power from teachers to administrators, while open technologies contribute to democratization by enabling access to information. In this context, the question concerning educational technology is indeed predominantly a matter of political choice. However, it cannot be denied that technical codes derived from our beliefs and assumptions “define a framework of

decision-making within which certain design choices appear rational and desirable” (Hamilton & Feenberg, 2012: 59). What are the dominant technical codes of contemporary education? Could you please analyze their main consequences?

AF: The dominant technical codes are still those that respond to traditional educational values, with certain unfortunate but tolerable deviations. These codes dictate such things as the standard size of class rooms, usually between 20 and 40, to which corresponds an ideal of human contact. There are also the large lecture halls which are a halfway step toward the dehumanization of education. But there are talented teachers who can use a large lecture hall to communicate effectively. The introduction of such new standards as online syllabi does not change education very much. Even online courses that employ web forums in which faculty lead online discussions continue to translate traditional educational values effectively. Where the real break occurs is with automation. Should automation become the dominant code we are in big trouble. That would be the end of education as we have known it since the Stone Age.

PJ: Almost half a century ago, Ivan Illich stepped out of the dominant technical code and developed two radically different proposals: *Deschooling Society* (Illich, 1971) and *Tools for Conviviality* (1973). Soon after, he was followed by Richard Stallman’s *Free Software, Free Society* (2002) and many others. In spite of developing a devoted body of followers, however, their proposals were never realized even remotely close to their full extent. What are the main pros and cons of stepping out of the dominant technical code? Is it possible to step out without reaching utopian or dystopian extremes?

AF: I think this is the wrong way of looking at the question. We tend not even to notice the most important changes in technical codes so vast are their impacts. Consider the Internet. It was conceived by the U.S. military to network mainframe computers. It evolved into a system for human communication. That is a radical change in purpose, reflected in the software on the system. Where did that change come from? Not from the military nor even from the corporations that now claim hegemony on the Internet. Those corporations are parasites which have latched on to the already existing body of a communication system innovated by its users. So, this is an example of stepping beyond the established code that is not utopian.

PJ: All your writings strongly emphasize that “technology can deliver more than one type of technological civilization,” that “we have not yet exhausted its democratic potential” (Feenberg, 2010: 28), and, as you said earlier in this conversation, that “there is really no precedent for this situation and no way to foresee the outcome.” However, this does not imply a laissez faire approach to the question concerning educational technologies, and we need – arguably,

more than ever – clear critical guidance about that matter. For the very end of this conversation, therefore, could you please provide some directions for using information and communication technologies in critical education? How should we approach our everyday technology-related decisions; where should we seek answers?

AF: The problem we confront is the pervasive hostility to teachers among those who pay their salaries. It is not a coincidence. Education is the largest expense of most governments. The desire to cheapen it is widespread among decision-makers. Neo-liberal ideology encourages contempt for everything that is not measured in monetary terms. If the ideological environment were not so polluted it would be easy to talk about the best way to apply new technology to education. We would then simply survey teachers' needs and offer them innovative products to discover which are picked up and used to enhance their service to their students. Of course this is not at all the way things are going. No one in power is interested in the opinions of teachers. Computer and software companies offering automated solutions are in control of the process. This does not mean that everything they do is bad, especially since it is still delivered into the hands of teachers who may figure out how to integrate it to a human-centered approach. We need to be careful not to assume that the intentions of designers are always realized by users. But the automating ideology is a constant threat and a factor of distortion in our thinking about educational technology. Teachers themselves need to become more sophisticated in their evaluation of these issues both to protect their own jobs and to protect the children in their charge from screwball schemes designed to profit companies at the expense of kids.

PJ: Thank you a lot for this exciting conversation, Andrew!

REFERENCES

- Bellamy, E. ([1888]1960). *Looking backward: 2000–1887*. New York: Signet.
- Bijker, W. E. (1996). Democratization of technology: Who are the experts? Retrieved 23 September 2014 from <http://www.angelfire.com/la/esst/bijker.html>.
- Castells, M. (2001). *The Internet galaxy: Reflections on the Internet, business, and society*. Oxford: Oxford University Press.
- Christopher, R. (2004). Questioning technology Andrew Feenberg. Retrieved 23 September 2014 from http://www.sfu.ca/~andrewf/frontwheeldrive_com%20andrew%20feenberg%20interview.htm.
- Dick, P. K. (1969). *Ubik*. New York: Vintage.
- Doppelt, G. (2006). Democracy and technology. In T. J. Veak (Ed.), *Democratizing technology: Andrew Feenberg's critical theory of technology*. Albany, NY: State University of New York Press, 85–100.
- Feenberg, A., & Barney, D. (Eds.) (2004). *Community in the digital age*. Lanham, MD: Rowman and Littlefield.

- Feenberg, A., & Freedman, J. (2001). *When poetry ruled the streets: The French May Events of 1968*. Albany, NY: State University of New York Press.
- Feenberg, A., & Friesen, N. (2012). *(Re)inventing the Internet: Critical Case Studies*. Rotterdam: Sense.
- Feenberg, A., & Hannay, A. (1995). *Technology and the politics of knowledge*. Bloomington, IN: Indiana University Press.
- Feenberg, A. (1986). *Lukács, Marx, and the sources of critical theory*. New York: Oxford University Press.
- Feenberg, A. (1991). *Critical theory of technology*. New York: Oxford University Press.
- Feenberg, A. (1993). Building a global network: The WBSI experience. In Harasim, L. (Ed.), *Global networks: Computerizing the international community*. Cambridge, MA: MIT Press, 185–197.
- Feenberg, A. (1995). *Alternative modernity: The technical turn in philosophy and social theory*. Berkeley and Los Angeles, CA: University of California Press.
- Feenberg, A. (1996). Marcuse or Habermas: two critiques of technology. *Inquiry*, 39, 45–70.
- Feenberg, A. (1999). *Questioning technology*. New York: Routledge.
- Feenberg, A. (2002). *Transforming technology: A critical theory revisited*. New York: Oxford University Press.
- Feenberg, A. (2003). Modernity theory and technology studies: Reflections on bridging the gap. In T. Misa, P. Brey, & A. Feenberg (Eds.), *Modernity and technology*. Cambridge, MA: MIT Press, 73–104.
- Feenberg, A. (2005). *Heidegger and Marcuse: The catastrophe and redemption of history*. London and New York: Routledge.
- Feenberg, A. (2010). *Between reason and experience: Essays in technology and modernity*. Cambridge, MA: MIT Press.
- Feenberg, A. (2012). Toward a critical theory of the Internet. In A. Feenberg & N. Friesen (Eds.), *(Re)inventing the Internet: Critical case studies*. Rotterdam: Sense, 3–18.
- Feenberg, A. (2014a). *The Philosophy of Praxis: Marx, Lukács and The Frankfurt School*. London: Verso.
- Feenberg, A. (2014b). Great Refusal or Long March: How to think about the Internet. In C. Fuchs & M. Sandoval, (Eds.), *Critique, democracy and philosophy in 21st century information society*. London: Routledge, 109–124.
- Feenberg, A. (2015). The May Events Archive / événements de mai 1968. Retrieved 23 September 2014 from <http://edocs.lib.sfu.ca/projects/mai68/>.
- Feenberg, A., Pippin, R., & Webel, C. (Eds.) (1987). *Marcuse: Critical theory and the promise of utopia*. New York: Bergin & Garvey Press.
- Giroux, H. A. (1991). Border pedagogy and the politics of postmodernism. *Social Text*, 28, 51–67.
- Gladwell, M. (2010). Small Change: Why the revolution will not be tweeted. *The New Yorker*, October 10. Retrieved 23 September 2014 from <http://www.newyorker.com/magazine/2010/10/04/small-change-3>.
- Godard, J. L. (1966). *Masculin Féminin*. Los Angeles: Columbia Films S.A.

- Hamilton, E., & Feenberg, A. (2012). Alternative rationalisations and ambivalent futures: A critical history of online education. In A. Feenberg & N. Friesen (Eds.), *(Re)inventing the Internet: Critical case studies*. Rotterdam: Sense, 43–70.
- Hill, D., McLaren, P., Cole, M., & Rikowski, G. (Eds.) (1999). *Postmodernism in educational theory: Education and the politics of human resistance*. London: Tufnell.
- Huxley, A. (1932). *Brave New World*. London: Penguin.
- Illich, I. (1971). *Deschooling society*. London: Marion Boyars.
- Illich, I. (1973). *Tools for conviviality*. London: Marion Boyars.
- Juutilainen, P. A. (1996). *Herbert's hippopotamus*. Los Angeles, CA: De Facto Fiction Films.
- Kochan, J. (2006). Feenberg and STS: counter-reflections on bridging the gap. *Studies in History and Philosophy of Science*, 37(4), 702–720.
- Liotard, J. F. (1984). *The postmodern condition: A report on knowledge*. Minneapolis, MN: University of Minnesota Press.
- McLaren, P., & Jandrić, P. (2014). Critical revolutionary pedagogy is made by walking – in a world where many worlds coexist. *Policy Futures in Education*, 12(6), 805–831.
- Misa, T., Brey, P., & Feenberg, A. (Eds.) (2003). *Modernity and technology*. Cambridge, MA: MIT Press.
- Orwell, G. (1949). *1984*. London: Secker and Warburg.
- Ralon, L. (2010). Interview with Andrew Feenberg. *Figure/Ground*, August 18th. Retrieved 23 September 2014 from <http://figureground.org/interview-with-andrew-feenberg-2/>.
- Stallman, R. M. (2002). *Free software, free society: Selected essays of Richard M. Stallman*. Boston, MA: Free Software Foundation.
- Van Dijk, J. (1999). *The network society*. London: SAGE.
- Walters, E. (2013). Jodi Dean and Andrew Feenberg Debate the Interweb. Retrieved 23 September 2014 from <http://www.critical-theory.com/jodi-dean-and-andrew-feenberg-debate-the-interweb/>.
- Winner, L. (1993). Upon opening the black box and finding it empty: Social constructivism and the philosophy of technology. *Science, Technology & Human Values*, 18(3), 362–378.