EDUCATIONAL FUTURES: RETHINKING THEORY AND PRACTICE

Petar Jandrić

LEARNING IN THE AGE OF DIGITAL REASON

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Learning in the Age of Digital Reason

EDUCATIONAL FUTURES
RETHINKING THEORY AND PRACTICE

Volume 70

Scope

This series maps the emergent field of educational futures. It will commission books on the futures of education in relation to the question of globalisation and knowledge economy. It seeks authors who can demonstrate their understanding of discourses of the knowledge and learning economies. It aspires to build a consistent approach to educational futures in terms of traditional methods, including scenario planning and foresight, as well as imaginative narratives, and it will examine examples of futures research in education, pedagogical experiments, new utopian thinking, and educational policy futures with a strong accent on actual policies and examples.

Learning in the Age of Digital Reason

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In early 2012 I started working on the first conversation about learning in the age of digital reason with Peter McLaren. This never-ending conversation, which still continues whenever Peter and I catch a free moment, has produced a huge amount of valuable material – more importantly, it has turned our professional collaboration into warm friendship. As I continued working on conversations with other interlocutors, one day Peter asked: Why don't you put all these articles together, and make a book of conversations with leading scholars about learning in the age of the digital media?

At a time, I had only a few complete conversations. Nevertheless, I immediately took up the challenge, wrote a book proposal, and sent it to another important contributor to this book – Michael Adrian Peters. Within and outside our written conversations Michael asked challenging questions about my approach to dialogue, opened my mind to new ideas and research directions, and helped me shape this book in its present form. As I continued working, Michael helped me to (p/re-)publish conversations in various academic journals and recommended this book to Sense Publishers. More importantly, Michael has also become a dear friend, and our collaboration has extended way beyond this book.

Armed by gentle support of Michael and Peter, it was reasonably easy to engage scholars working in the fields of philosophy, history, and educational studies. Yet, I conceived this book as a transdisciplinary dialogue between people working in various disciplines. In order to push readers beyond their comfort zones, therefore, I first needed to take the leap into the unknown myself.

Entering the field of media studies I requested help from an old friend Marcell Mars, who recommended me to talk to McKenzie Wark. One foggy day, I met Ken in his favourite café in Queens and explained my ideas. Little did I know what Ken's support would provide – during our two-year conversation, he gently taught me about media studies and directed my research towards other interlocutors. It was Ken who introduced me to works of Howard Rheingold, Fred Turner, and Richard Barbrook – and it was Ken who helped me to enter their busy schedules. Doing these conversations, I (again) made new friends: McKenzie Wark, Tomislav Medak, Richard Barbrook … Slowly but surely, however, the time to (again) venture into pastures new and unexplored has arrived.

I have always been acutely aware that this book could never achieve true transdisciplinarity without the arts. Yet, the arts seemed completely out of my league, and I was almost ready to sacrifice the book's completeness to own incompetency. It is here that transdisciplinarity was saved by my beloved partner and the reknowned artist Ana Kuzmanić who stepped in, made some time in her busy exhibition schedule, and co-authored several arts-related conversations. As a practical artist, Ana Kuzmanić suggested me to include the art historian Ana Peraica, who made very important insights into the conversation with Kathy Rae Huffman.

From the very first conversation in this series I was blessed with constant support from two dear friends – Hamish Macleod and Christine Sinclair. They read numerous blurbs and proof-read final pieces, built up my confidence crashed by rejections from potential interlocutors and broken deadlines, and believed in me throughout the way. Furthermore, this project has required a considerable amount of support at the workplace; in some phases, it also required a lot of travelling. Dean of the Zagreb University of Applied Sciences Slavica Ćosović Bajić supremely rose to both challenges, and created a safe space where I could pursue this work. I also extend big thanks to Peter de Liefde from Sense Publishers, who accommodated my repeated breaches of agreed deadlines; Jolanda Karada, who superbly organized all aspects of the book's production; and Rafaela Dražić, who provided the book with its unique design.

This book is a textbook case of "making the path by walking" (McLaren, 2005: 160). Following the footsteps of presented conversations, one could easily write a story of the past five years of my life and map the majority of new friends I acquired in that period. Certainly, one can only have so many friends – for one reason or another, my relationship with many interlocutors has remained strictly professional. Yet, it is very important to acknowledge people such as Larry Cuban, Andrew Feenberg, Paul Levinson, and others, who – without any previous introduction or personal connection – entrusted their time and energy to an anonymous stranger who contacted them by email, on social networks, or approached them after their public talks. Generosity of these people, who gave a precious gift of their time to someone they never met before, has repeatedly restored my faith into humanity.

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During five years of preparing this book many conversations have been published, republished, expanded, abbreviated, and translated. Published conversations were instrumental in presenting this work to new interlocutors and readers, and complex publishing processes provided valuable feedback from numerous editors and reviewers. I would like to thank the following publications for their permissions to reprint (parts of) conversations in this book:

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McLaren, P., & Jandrić, P. (2017a). From liberation to salvation: Revolutionary critical pedagogy meets liberation theology. *Policy Futures in Education*. (A long new conversation about liberation pedagogy which has been partially reproduced here.)

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Vilensky, D., Kuzmanić, A., & Jandrić, P. (2016). *Equal in inequality: True art knows how to wait*. Oslo: TOpublic. Retrieved 22 July 2016 from http://www.motoffentlighet.no/single-post/2016/03/26/De-kollektive-kunstpraksisene-av-Dmitry-Vilensky. (An early, much shorter version of the conversation published in this book.)

Wark, M., & Jandrić, P. (2016). New knowledge for a new planet: Critical pedagogy for the Anthropocene. *Open Review of Educational Research, 3*(1), 148–178.

INTRODUCTION

I would like to throw a party – nothing fancy, just a simple barbecue with some cool drinks. To this party, I would invite everybody who wants to say something about human learning in the age of digital reason. While my guests would eat, drink, and perhaps play table tennis, I would silently move from one group to another and lurk into their conversations. As strange as it may seem, I think that would be the best party of my life.

But such parties do not happen in the real world. Certainly, Peter McLaren, Henry Giroux, and Michael Peters are friends that get together on regular basis; the same goes for McKenzie Wark, Richard Barbrook, and Fred Turner, as well as many other people presented in this book. As a rule of thumb, however, these connections seem to be shaped by similar disciplinary interests, educational backgrounds, political agendas, and personal paths. Yet, the party of my dreams is different. I am not interested in bringing old friends together – instead, I want to link people who do not normally talk to each other, transgress disciplinary borders, and foster conversations that are unlikely to take place elsewhere. At the intersections of these people and their ideas, I would like to try and create a new spectrum of (educational) opportunity for a better society.

Unfortunately, this party is a distant ideal. As the Poet says, "There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy" (Shakespeare, 2017). Instead of giving in to hopelessness, however, I decided to do the best available thing I could think of – discuss my interests with people working in various disciplines and perspectives, and place these discussions side by side in this collection. This book is an attempt to throw a virtual party of my dreams. Paraphrasing another, more contemporary Poet: It's my party, and I invite whom I want to, and I ask what I want to, and I arrange conversations as I want to – and that is simultaneously the main strength and the main weakness of this book.

This book contains 16 conversations with people working in philosophy, history, media theory, education, practice, activism, and arts. The majority of these people wear more than one hat – Paul Levinson is a media theorist and a science fiction writer, Astra Taylor is a film-maker and an activist … My choice of interlocutors was aimed at the utopian task of covering all major areas and traditions interested in human learning. However, every act of inclusion is mirrored by an act of exclusion. Inclusion of philosophy and history resulted in exclusion of psychology and anthropology; inclusion of different generations resulted in exclusion of some important contemporary figures. Furthermore, I am acutely aware of this book's unfortunate bias towards male intercolutors, towards those employed in institutions of higher education, and towards those who live in the Global North. While there is no excuse for these imbalances, they do tell an important story about challenges and limits to dialogic approach in the network society.

I identified potential interlocutors based on their works and personalities. At first I would look for general information in sources such as encyclopaedic entries, films, and main critiques, and I would try to understand the significance of their contributions. Then I would approach people – through emails, at conferences, or through recommendations from previous interlocutors. In the first contact I would succinctly present this book and the main reasons why they should enter the conversation. However, collaborative writing is a curious act of love for inquiry and generosity towards other people, and it requires a significant investment of time and passion. Some of my conversation requests were met with obvious pleasure, others were met with caution, and at least half of conversation requests resulted in rejections. After long and futile attempts of understanding reasons behind rejections, I concluded that the essential forces shaping this book are emotional seduction and mutual attraction – not unlike the decision to dance with a stranger on a crowded dance floor.

From my side, an average conversation required between 15 and 30 days of work. However, time span between the first contact and the authorised text varied significantly. Starting in early 2012, the conversation with Peter McLaren has not ended until this day; the shortest conversation, with Andrew Feenberg, took a bit less than a month. Average time of writing these texts was about one year. In order to complete the book within my lifetime, therefore, I needed to work on several conversations at a time – and this can be felt in connections between the pieces.

People approached the conversations in a wide variety of ways. Peter McLaren, Michael Peters, Andrew Feenberg, Fred Turner, Larry Cuban, Christine Sinclair, Hamish Macleod, Marcell Mars, and Tomislav Medak conversed in writing. Some people answered my questions in one or two batches; others engaged in multiple email exchanges and fostered true written dialogues. Siân Bayne, Richard Barbrook, Astra Taylor, Henry Giroux, Paul Levinson, Kathy Rae Huffman, and Howard Rheingold preferred to talk in person. Some of them authorised transcriptions with minimal changes; others did a lot of revising. McKenzie Wark, and Dmitry Vilensky started the conversations in writing, and finalized them in person. These differences have significantly shaped the style and content of conversations, so I decided to present short histories of my interactions with the interlocutors at the beginning of each chapter.

The conversations have been conducted during the period of five years. The first conversation, with Peter McLaren, started in early 2012; the last conversation, with Christine Sinclair and Hamish Macleod, was completed in March 2017. I did my best to provide all interlocutors with an equal amount of attention. However, there is no doubt that late interlocutors have talked to a much more competent person than early interlocutors. It is not exaggerated to say that my interlocutors in this book are the greatest teachers I even had – and this little injustice simply goes with the turf.

Writing this book was a true journey into the unknown. Instead of planning its structure, I was gently pushed by Peter and Michael into shaping my thoughts. Instead of choosing interlocutors, I was chosen by people who found my ideas of interest. Instead of writing the text, I asked questions and let the book write itself.

This book reflects my personal history, and the historical moment we live in. Letting things go inevitably results with insecurity and non-predicability. Arguably, however, it is only through leaving our comfort zones that we can learn something truly new. This book throws a wild, spontaneous party on the theme of learning in the age of digital reason with people working in various perspectives and disciplines – and I do hope that you will enjoy this party as much as I did!

HISTORY AND PHILOSOPHY

CHAPTER 1

THE DUBIOUS PROMISE OF EDUCATIONAL TECHNOLOGIES: HISTORICAL PATTERNS AND FUTURE CHALLENGES

Conversation with Larry Cuban

Larry Cuban is Emeritus Professor of Education at Stanford University, California. His main research interests are history of curriculum and instruction, educational leadership, school reform, school effectiveness, and the uses of technology in the classroom. The youngest of three sons of Russian immigrant parents and the only one to attend college in his family, Larry started his career as a high school teacher of history in 1956 and he taught high school for a total of 14 years. After earning a PhD in the history of education in 1974, he moved on to the position of district superintendent and served for seven years. He finally became a professor at Stanford University in 1981 and served as a professor for 20 years.

In 1990–1991 he was president of the American Education Research Association (AERA). At Stanford School of Education, students voted him Teacher of the Year seven times. As a practitioner, he continually works with teachers and administrators and participates in various policy projects. Since becoming Professor Emeritus, he has continued to teach a seminar on 'good' schools, to do research in schools and to write, including his worldwide popular twice-weekly blog.

Larry has published numerous "op-ed pieces, scholarly articles and books on classroom teaching, history of school reform, how policy gets translated into practice, and teacher and student use of technologies in K-12 and college" (Cuban, 2016). His books include *Teachers and Machines: Classroom Use of Technology Since 1920* (1986), *How Teachers Taught: Constancy and Change in American Classrooms, 1890–1990* (1993), *Tinkering toward Utopia: A Century of Public School Reform* (with David Tyack, 1995), *Oversold and Underused: Computers in the Classroom* (2001), *Why Is It So Hard to Get Good Schools?* (2003), *The Blackboard and the Bottom Line: Why Schools Can't be Businesses* (2005), *Hugging the Middle – How Teachers Teach in an Era of Testing and Accountability* (2008), *Inside the Black Box of Classroom Practice: Change without Reform in American Education* (2013), and many more. His most recent book is *Teaching History Then and Now; A Story of Stability and Change in Schools* (2016b).

CHAPTER 1

ABOUT THE CONVERSATION

This conversation took place before I shaped the idea for this book – it was conducted for the Special Issue of *E-learning and Digital Media* entitled 'Networked Realms and Hoped-For Futures: A Trans-Generational Dialogue' (Jandrić, Sinclair, & Macleod, 2015). Larry and I never met in person, and the text was written through seven email exchanges during late 2013 and early 2014. The original conversation is reproduced in a slightly abridged form.

HOW TO INVENT THE PAST?

Petar Jandrić (PJ): Two decades ago, in 'Four Stories: About National Goals for American Education,' you wrote:

> Historians invent the past. I do not mean that historians invent facts, although they frequently discover new ones; I mean that historians ask questions of the past, analyse the available sources and evidence, and filter the data through their experiences, values, and expertise to create their own versions of what happened. Because historians are products of their times and differ one from the other, histories of the same event, era, or institution will vary. As vividly demonstrated in the classic film *Rashomon*, in which the story of an attack on medieval nobles is told from different points of view, history is woven out of multiple interpretations of what happened. (Cuban, 1990: 265)

Together with many other readers, I tremendously enjoy your inventions of the past outlined in books such as *Teachers and Machines: Classroom Use of Technology Since 1920* (Cuban, 1986). However, speaking of things that happened 60 or 70 years ago is obviously very different from speaking of technological developments that happened last summer.

What happens to traditional historical thinking in the age of the network? Can we still apply traditional historical approaches to the questions concerning education and technologies? Using the metaphor from another of your early articles (Cuban, 1995), should we conduct our research like hedgehogs or like foxes?

Larry Cuban (LC): I cannot recommend either the fox or hedgehog approach to research. Both seem to be essential but I do know for sure that I am a hedgehog. By that I mean I have persisted in investigating how teachers have taught during high visibility reform periods in the past and how policy, then and now, gets translated into classroom practice. Technological innovations, of course, mandated by policymakers or eagerly embraced by educators (or both) fit into my unrelenting focus on teachers and teaching, past and present. So I have looked at past efforts school reformers have made to introduce technological innovations and found patterns – see *Teachers and Machines* (1986). Those cyclical patterns have accompanied new technologies for nearly a century: reform-minded policymakers surround the innovation with extravagant claims followed by academic studies showing limited or unimaginative classroom use of devices followed by disappointment and then blame heaped upon teachers rather than those who made

the initial claims. Two current versions of that cycle I see unfolding right now with the spread in the US of tablets and 1:1 tablets and laptops. The cycle also appears in Massive Open Online Courses (MOOCs) in higher education.

Knowing historically that these cycles have been present for over a century and how earlier generations of well-intentioned reformers faced similar situations as do current cheerleaders for tablets and MOOCs could help contemporary decision-makers design policies and implementation campaigns that incorporate teachers early in the process of buying and deploying the newest high-tech device and software. In my judgement, then, describing and analysing the past, particularly the nexus between new technologies and schooling, is needed even more to inform policymakers, practitioners, and researchers.

PJ: Educational research is sometimes inspired by science fiction, which allows us to 'experiment' with alternative realities, and even with parallel histories, without real-life consequences. Famous works of science fiction such as Isaac Asimov's opus dedicated to robotics, Stanley Kubrick's *2001: A Space Odyssey* (1968), William Gibson's *Neuromancer* (1984) and the Wachowski Brothers' The Matrix (1999) (just to mention a few) have also served as ongoing sources of inspiration for (computer) scientists. What do you think of attempts to inspire educational research by science fiction? Can we interpret those imagined and/or hoped for futures as genuine thought experiments?

LC: Futuristic scenarios of schooling predicting (or wishing for) what schooling will be like a half century or a full century from now have been around for decades. (Either inspired by science fiction or created out of one's imagination, ones now put forth read like science fiction to me – nearly all instruction for children and youth online and the disappearance of bricks and mortar schools with all schooling occurring in the home, workplace, and other settings.) A number of advocates for online learning in K-12 schools see the eventual replacement of formal schools by children and youth working at home and non-school sites including the workplace. Historically, I have seen so many of these fictional leaps into the future with a nearly inevitable lack of substantial movement toward such scenarios. So I remain highly sceptical of these scenarios. Nor do I take them seriously as thought experiments. I do take them seriously as hoped for futures. When such fictitious leaps do appear, they tell me more about the values and aspirations of the author(s) than predicting what will occur.

PJ: Your works often refer to concepts from Everett Rogers' theory of diffusion of innovations (Rogers, 1986, 1995; Jandrić, 2015a) such as 'early adopters,' 'late adopters' and 'laggards' (i.e. Cuban, 2003: 105). Up to fairly recently, it made a lot of sense to apply Rogers' theory to the relationships between computers and education: year by year, one could literally see incremental increase in adoption of information and communication technologies in Western schools. Nowadays, however, when most citizens of the developed world are constantly connected, counting computers or users of certain software might seem a bit outdated. What is the relevance of Rogers' theory of diffusion of innovations for the contemporary relationship between education and information and communication technologies?

Could Rogers' theory be antiquated? Could it, perhaps, be complemented by more nuanced approaches? Where should we look for those new approaches?

LC: You raise a nice point here. I have used Rogers' diffusion theory because it did fit the first three decades of the introduction of high-tech devices into schools. There are two reasons, however, that other theories should be tried out to explain the spread of both devices and software, of teacher use in classrooms, because, as you point out, devices and software are becoming ubiquitous in the developed world. First, Rogers' diffusion theory has certain biases built into it. For example, the theory favours those who adopt new technology over those who do not or are slow in embracing the innovation, i.e. 'laggards.' The theory ignores the simple truth that in some situations with some innovations, teachers and other educators may have ample justification to say no to a new policy, a new device or software. Saying 'no,' however, is viewed as a negative within the theory. The second reason is that blame haunts the theory. For those who are slow to adopt or chose not to adopt, or when innovations suffocate for lack of resources, users such as teachers, more often than not, get blamed. That, too, is built into the theory.

For those reasons, other ways of looking at how innovations spread should become part of the researcher's repertoire. For example, theories that look more closely at the features of the innovation and the context in which the innovation is placed make a great deal of sense to me. The interaction between innovation characteristics and the conditions present in particular settings needs to be investigated without blaming who does the implementation or how it unfolds in particular settings. Also consider *Hype Cycle* developed by private sector consulting firm Gartner as another way of defusing bias and blame inherent in diffusion theory. The *Hype Cycle* tracks the historical path that technological innovations have followed. According to people's expectations, it divides that path into the following five phases: technology trigger, peak of inflated expectations, trough of disillusionment, slope of enlightenment and plateau of productivity (Gartner, 2014). In this way, the *Hype Cycle* offers another way to examine the context interacting with the innovation free of blame, but even this construct contains biases that need to be made explicit.

MAGICAL GENIE FROM THE COMPUTER

PJ: In a recent blog post, you quote Mike Trucano's "one of the 9 worst ed tech practices in the developing world: *Dump hardware in schools, hope for magic to happen*" (Cuban, 2014a), and expand it into a very interesting historical analysis. What is magical thinking in the context of schooling and computers? Where does it come from; will it ever end?

LC: Magical thinking is a belief in scientifically unproven causal relationships between human actions and events. It may well be hard wired into our brains: after all, one can see it in action during illnesses we have, disappointment in careers, or even in troubled families. And it occurs in organizations undergoing stresses in dealing with serious problems. Thus, during times when schools have been heavily criticized for failing (which has been the case in the US since the mid 1950s),

electronic technologies – Skinner's 'teaching machine' was popular in the 1950s – have been drafted time and again to alter teaching and get students to learn more, faster and better. So magical thinking, in my opinion, seems to be connected to times when each of us, including school reformers, wish for a better, happier time. In a society enamoured with new technologies, it would seem to occur often.

PJ: *Oversold and Underused* (Cuban, 2001) clearly shows that teachers use computers in their private lives much more than in their professional lives. Much of the reference to school usage of technology, however, is about its imposition, as it were, by authorities and interested groups. Is there any correlation between these facts? What about personal ownership of powerful technologies by the students and teachers themselves and what about their status as experienced (by some definitions) users of social media?

LC: Yes, there is a correlation between mandated or imposed uses of new technologies and implementation problems showing up in classrooms, particularly if teachers' legitimate concerns and needs are ignored in the policy discussions about improved teaching and learning. That has happened often in past deployments of new technologies in the US. From the experiences of one-laptop-per-child in other countries, it may be the case as well.

The gap in use of computers between school and home for teachers may be related to the above point and also linked to the lack of relevant software, on-site technical assistance, and lack of first-hand evidence that students will achieve more academically with electronic devices. The discrepancy in use between home and school has little to do with the teacher's experience with devices or social media and far more to do with the historic role of teacher as gatekeeper to the classroom, a role that policymakers have generally overlooked or ignored for decades.

PJ: What about the anarchy brought about by the students having their own devices, and the frequent response to this of banning the use of such personal devices in the classroom or school?

LC: There have been examples of schools urging students to bring their own devices and having teachers work with a myriad of mobile devices. While some of these experiments may linger for a while, in an age where standardization in policy, procedure and equipment is the clear direction that the US and other nations have taken, such instances of bring-your-owndevice will become footnotes to any history of technology use in schools.

PJ: Your research clearly shows that large classroom desktop or laptop computers are *Oversold and Underused*, and predicts that with these technologies "no fundamental change in teaching practices will occur" (Cuban, 2001: 196). During the past decades, however, computers have evolved into various hand-held devices that have become our constant companions. The desktop computer links us to the Internet, but the smartphone transforms us into truly networked, cyborg-like organisms which strongly resemble androids from James Cameron's film Terminator (1984). In *Alone Together: Why We Expect More from Technology and Less from Each Other*, Sherry Turkle calls that phenomenon "the new state of the self" (2012: 157), and identifies the "life mix" as "the mash-up of what you have on- and offline" (Turkle, 2012: 160). Inspired by your recent blog post about the

effects of high-tech on people (Cuban, 2014b), could you try and create a baseline for comparison between those generations of technology? Do you think that this "new state of the self" has the potential to challenge the ways that information and communication technologies are currently being used in education?

LC: Yes, I do. The potential is there. Futuristic scenarios of virtual schools and the gradual elimination of bricks-and-mortar schools capture the potential that champions of accelerated online instruction push. Realizing those scenarios, however, will continue to disappoint advocates of establishing more virtual schools. Why?

Advocates for virtual schooling largely ignore a historical fact. The larger political, social and economic role that public schools have performed (and continue to do so) has to be taken seriously since multiple goals for tax-supported public schools have been a reality for two centuries in US schools and I suspect for most other nations with publicly financed educational systems. Moreover, any gap between major changes in society, the economy and cultures, and what schools are doing has been translated time and again into school reforms to eliminate those gaps. In the US and most of Europe, tighter links between the economy and schools over the past quarter century, for example, have been forged in the belief that tougher standards, tests and accountability will improve schools and strengthen the economy by producing multi-skilled graduates entering the labor force.

Or consider another example. The swift access and use of mobile devices in the US and developed world have not yet been matched by changes in how schools are organized, how teaching usually occurs and gains in student achievement – expectations raised by the new technologies applied to schools. A large gap continues to exist between the daily whirl of information and communication devices outside the school and what teachers do with students inside their classrooms. In the US, a buying binge has occurred to stock classrooms with devices and new software to reduce the gap.

But organizations, I have learned from both research and experience, have plans for those who seek to change routine policies and procedures inside those organizations, especially for a community institution with many aims (e.g., civic engagement, socializing the young into community values, reducing inequalities) that transcend acquiring information and swift communication. Most institutions such as schools, hospitals, the criminal justice system and the military try to maintain their stability amid constant calls for changing what they do. As organizations, these institutions have learned to incorporate changes into ongoing routines. Thus, stability and change exist in most of these institutions in uneasy tension. Academics call this tension: "dynamic conservatism" (Schön, 1971: 39). I see that dynamic conservatism at work in schools as they learn to accommodate to frequent and urgent calls for change in policies and daily practices. Too many cheerleaders for high-tech believe that hardware devices and software applications will revolutionize schooling practices. They, sadly, ignore or forget these lessons learned by earlier generations of reformers.

PJ: You spent more than half a century within schools. However, information and communication technologies have opened up vast spaces for less formal

teaching and learning. During the 1970s, a small band of researchers such as Everett Reimer (*School is Dead*, 1971), Paul Goodman (*Compulsory Miseducation*, 1973) and Ivan Illich (*Deschooling Society*, 1971) called for complete abandonment of the traditional concept of schooling through information and communication technologies. In order to replace traditional schools, Illich proposed creating large-scale, non-institutional educational infrastructures consisting of a set of four interlocking educational networks: reference services to educational objects, skill exchanges, peer-matching and reference services to educators-at-large (Illich, 1971). After more than four decades, this vision is embodied in various initiatives such as the Khan Academy (2014), and it is easy to agree with Hart's conclusion that "it is not too far-fetched to assert that Illich predicted the World Wide Web" (2001: 72). What do you think of the contemporary potential for deschooling?

LC: Deschooling in 2014 comes wrapped in the mantle of total online or virtual schooling, home schooling and similar schemes that dispense with brick-and-mortar schools. Sure, access to the Internet and fire hydrant gushers of information does appeal to many champions of more high-tech in schools – some of those champions, however, might wince at what Ivan Illich, Paul Goodman and Everett Reimer wrote in the full flush of school-haters in the 1960s and 1970s. What so many deschooling advocates overlooked then (and now) in their zeal to dismantle public schools, both good and bad ones, are the multiple functions that public schools serve in a democratic society. Most of the deschooling advocates were opposed to US schooling on ideological, not effectiveness, grounds. Schools taught conformity, squelched real learning, overlooked individual differences among children and youth, and were holding tanks for eventual dropouts.

Today, eager promoters of high-tech in schools are less concerned about political and social ideology as that earlier generation was. Much of their eagerness for virtual schools is driven by the failure of public schools to be efficient and effective in producing graduates who can enter the labor market and be productive workers – a different ideology, to be sure. Where producing graduates for the economy the primary goal of tax-supported public schools in the US, perhaps deschooling might have some traction. But that is not the case. Schools have custodial and socialization functions (e.g., becoming productive citizens, abiding by community norms, thinking critically, etc.) that are crucial to a democratic society. Deschooling advocates of the 1970s wanted to dispense with those functions completely. High-tech champions of online schooling and blended schools, too often ignore these functions in their lust for more, better, and faster information and communication in schools.

PJ: Could we say, then, that the idea of deschooling is just another example of magical thinking?

LC: Yes, it is a prime example of that wishful thinking.

CHAPTER 1

PUBLIC INTELLECTUALS IN AND FOR THE AGE OF THE NETWORK

PJ: In the first half of *Tinkering toward Utopia: A Century of Public School Reform*, you and David Tyack have analysed educational progress as ideology (1995). Therefore, it would be interesting to expand your analysis of ideology to information and communication technologies. In *Technology and Science as Ideology*, Jürgen Habermas claims that

> The progressive 'rationalisation' of society is linked to institutionalization of scientific and technological development. To the extent that technology and science permeate social institutions and thus transform them, old legitimations are destroyed. The secularisation and 'disenchantment' of action-orienting worldviews, of cultural tradition as a whole, is the obverse of the growing 'rationality' of social action. (Habermas, 1970: 81)

This claim is clearly reflected in many aspects of your work. Nowadays, for instance, rationalization is often interpreted through introduction of business methods into schools and your book *The Blackboard and the Bottom Line: Why Schools Can't be Businesses* (Cuban, 2005) provides prime arguments against destruction of old legitimations. However, Habermas' thinking is deeply embedded in the spirit of the industrial society powered by traditional mass media such as radio and television. Can you reflect on the ideological role of information and communication technologies in contemporary school reform?

LC: The ideology of progress embedded historically in school reform that David Tyack and I analyse in *Tinkering Toward Utopia* (1995) is still alive and well in 2014. It is called ICT (information and communication technology), online instruction and virtual schooling. Flush with hype, reformers promoted electronic technologies in the 1920s as ways of getting students to learn more, faster and better than they had, and for teachers to alter traditional ways of teaching. That continues today globally. While deep divisions among US school reformers exist, currently top political and business leaders see ICT, along with expanded parental choice of schools, national curriculum standards, testing and accountability for results, as the eight-cylinder engine for transforming schools into more efficient, effective institutions producing graduates who can enter the labor force and contribute to a growing economy. For example, the surge of interest in online instruction in elementary and secondary public schools and the spread of virtual schools is one feature of the contemporary reform agenda mirroring this ideology of inevitable progress toward a more rational economy, efficiently operated institutions and effective school performance.

PJ: During the past decade or so, there has been a lot of talk about the potential of information and communication technologies for democracy (i.e. Jandrić & Boras, 2012). In several books, including but not limited to *Why Is It So Hard to Get Good Schools?* (Cuban, 2003), *Hugging the Middle – How Teachers Teach in an Era of Testing and Accountability* (Cuban, 2008) and *Tinkering Toward Utopia: A Century of Public School Reform* (Tyack & Cuban, 1995), you analyse the social role of education in a market-driven democracy. How do you link traditional

relationships between education and democracy with information and communication technologies?

LC: The short answer is ICT entered schools largely for economic and social reasons. Yes, there was also a political rationale such as increased civic participation in and out of schools, but it was clearly subordinate to the other reasons. The long answer is as follows.

Beginning in the early 1980s with the introduction of the personal computer, reformers touted not only the use of computers in schools as the remedy for a declining economy and failing schools, but also a way of expanding child and youth participation in community affairs, building civic engagement and revitalizing the democratic spirit in the US. Keep in mind that using the word 'democracy' can mean different things to different people: an individualistic-driven version, a communitarian one and a deliberative form. Such definitions matter and need to be made explicit. They went undefined in these years. Since those heady times, when scenarios of high-tech citizen participation became standard fare for those championing new technologies outside of schools, the belief that using computers and hand-held devices will strengthen policy deliberations and democratic practices in schools and at all levels of government (however defined) still remains a strong vision for ICT enthusiasts.

The appeal of the Internet encouraging virtual communities and democratic participation has attracted academic researchers, political leaders, and educators. Lincoln Dahlberg (2001) and Benjamin Barber (1998) argue that these new technologies can nurture different forms of democracy but as far as I can see, beyond outlier examples, such arguments have yet to persuade educators to use ICT regularly in schools and classrooms to encourage more democratic practices in classroom lessons. Perhaps part of the reason for this is that in the past thirty-odd years, policy elites have stressed an economic rationale for schooling (i.e. prepare the next generations with job-anchored skills for an ever-changing workplace) thus superseding a political rationale, i.e. civic engagement. Thus, I have yet to see that the growth of new technologies, their ubiquity and use in schools have led to increased student participation either in schools or as high school graduates engaged in their communities, or even increased rates of voting over the past three decades.

PJ: You are a prolific writer of academic books and articles, and a very active blogger. Since 2009, your website, *Larry Cuban on School Reform and Classroom Practice* (2014c), has been accessed nearly 800,000 times by readers scattered all around the world (nearly 40% are international viewers). More often than not, your texts have provoked vivid online discussions containing 30, 40 or even 50 responses. This level of public engagement demands a lot of your time and effort. In the current academic setting, however, it is definitely considered less 'important' than standard forms of academic writing. As Emeritus Professor, you do not have to worry about the academic games of prestige. However, the rest of us mortals must carefully choose our battles in order to survive in the academic markets. If you agree, I would like to 'attack' this problem on two separate levels. First, what is the future of traditional publishing formats (such as books, journals and

newspapers) in the context of information and communication technologies? Second, how does it reflect to the world of the school/academia?

LC: For someone who has only a 50% average in predictions – see forecasts that I made in *Teachers and Machines* (Cuban, 1986) – I have a mediocre record in looking around the corner to see the future interaction between ICT, academic advancement and traditional publishing formats, that is books, journals, etc. Consider that in the US there has been a steady drop in tenure-line positions in colleges and universities with a corresponding increase in short-term adjunct, non-tenure positions. For those academics in tenure-line posts seeking promotion, more and more peer-reviewed journals will be online and peer-reviewed e-books and similar electronic versions will spread. So I believe that getting published in traditional venues will continue to be the gold standard. In these tenure-line academic positions, I doubt very much whether being a blogger will help one get promoted, however. In the US, I do not know of any concerted effort in universities to include blogs as part of the portfolio submitted for a tenure decision. Depending on the academic discipline, being first author on a team-produced article or writing a book will continue, in the short term, to be highly prized within colleges and universities. Once tenure is gained, however, for those academics who aspire to reach larger audiences (e.g. teachers, administrators, policymakers and parents) for their ideas and research, then blogging is clearly one venue that goes beyond those few thousand who read academic journals.

I see writing for larger audiences as a form of teaching, not for academic advancement or influencing the discipline. Newspaper articles, blogging and writing for general audiences in large-circulation online and print magazines is a way of getting ideas into the school reform marketplace, offering different perspectives that readers may not have encountered elsewhere.

PJ: History is one of the subject areas which clearly show that teaching is much more than a job, and our duties reach far beyond achieving 'benchmarks' of standardized curricula and testing. Whenever we enter our classrooms, our thoughts, opinions and attitudes become public – in this sense, all teachers are public intellectuals. Up to a few decades ago, traditional mass media such as newspapers and books have allowed only so much space to publish our thoughts outside classrooms – and entrance to this space has been carefully guarded by a whole structure of editors, reviewers and other gate-keepers. Nowadays, however, information and communication technologies are supporting wide spaces for public engagement without middlemen. Anyone can start a blog, and its success depends only on the author – having skipped middlemen, we fall into a rabbit hole where millions of websites float and struggle for recognition. What are the main challenges pertaining to teachers' public engagement in the age of the network?

LC: I have been very impressed by the last decade's explosion of teacher and principal blogs, including ones from retired teachers and other practitioners. Many of my blog viewers are teachers and school-site administrators – where they find the time to read and write I do not know – and I learn a great deal from those who I read. I consider this flowering of teacher and administrator writing a decided plus for the profession and public debate over policy.

HISTORICAL PATTERNS AND FUTURE CHALLENGES

PJ: Your prologue to *Tinkering Toward Utopia* makes a very convincing historical argument that "reforming the public schools has long been a favourite way of improving not just education but society" (Tyack & Cuban, 1995: 1). In your talk in Barcelona (Cuban, 2010), you named this process 'educationalizing' of various social and economic problems. Similarly, information and communication technologies also seem to be perceived as a panacea for almost everything. Our factories are losing from competition? Let's buy new computers. Our office productivity fails? Let's buy new computers. Our students fail at standardized tests? Let's buy new computers. For the purpose of this argument, I will name this process 'technologizing' of contemporary social problems and cautiously add that a Google search for this term (conducted on 7 June 2014) returns only four sources. How would you analyse the relationships between 'educationalizing' and 'technologizing' of our society?

LC: David Labaree has used the term 'educationalizing' to refer to the US policy elites' habit of using school reform to solve US social, economic and political problems (see Labaree, 2008). What 'educationalizing' means is transferring societal structural problems to the institution of schooling so individual students and teachers then become first, an easy target to blame, and second, responsible for solving the problem. For example, national health problems of smoking tobacco and drinking alcohol in the prior century got translated into school courses for youth about the physical and cognitive damages done by both drugs. Too many road accidents? Driver training and completing a safe driver's course for high school graduation became a school-based solution to a national problem. And as you pointed out in your question, the harnessing of schools to an increasingly high-tech economy means that children and youth are engaged early and persistently in using electronic devices so that they can easily fit into a high-tech workplace. What you call 'technologizing' to me becomes just another instance of policy elites 'educationalizing' a national economic problem into school reforms focusing on teacher and student use of devices, implying that such access and use of devices in schools across the country will somehow improve national economic growth and productivity.

PJ: Three decades ago, you published *Teachers and Machines: Classroom Use of Technology Since 1920*. Only four years after the famous appearance of the computer on the cover of Time magazine in 1982, you dedicated a whole quarter of the book to "the promise of the computer" (Cuban, 1986: 72–103). Some of the presented conclusions are just as relevant today. For instance, it cannot be disputed that "to question computer use in schools is to ask what schools are for, why teachers teach certain content, how they should teach, and how children learn" (*ibid*: 98). At the time, however, it was impossible to predict the depth and extent of social change brought by information and communication technologies.

Standing on the shoulders of previous research efforts, we can learn from fulfilled predictions just as much as we can learn from failed promises. Based on the most successful predictions and the deepest historic failures, therefore, what

can be learned from the first one hundred years of marriage between education and technologies? If you set out to rewrite *Teachers and Machines*, what would you do differently?

LC: Thanks, Petar, for recalling that quote from *Teachers and Machines*. It is the one I have used often. Please allow me to reproduce the blog post I wrote about this topic five years ago:

> A quarter-century ago, I described and analysed the history of machines deployed in classrooms (film, radio, instructional television and the newly arrived desktop computer) to help teachers teach more, faster and better. Then I did something foolish in the final chapter. I predicted future uses of computers in classrooms from my vantage point in 1986.
>
> Of course, I was not alone in making predictions. Seymour Papert dove into the same empty pool that I did a couple of years before my venture into crystal ball gazing:
>
> > There won't be schools in the future … I think the computer will blow up the school. That is, the school defined as something where there are classes, teachers running exams, people structured in groups by age, following a curriculum – all of that. (Papert, 1984)
>
> Based upon my research in schools and experience as a teacher and superintendent, however, I was far more sceptical about the penetration and use of computers than Papert. Here is what I predicted in *Teachers and Machines* for computers in schools:
>
> > I predict that … in elementary schools where favourable conditions exist, teacher use will increase but seldom exceed more than 10 percent of weekly instructional time [roughly 3 hours a week]. Pulling out students for a 30-to-45-minute period in a computer lab will, I suspect, gain increasing popularity in these schools … In secondary schools, the dominant pattern of use will be to schedule students into [labs] and one or more elective classes where a score of desk-top computers sit … In no event would I expect general student use of computers in secondary schools to exceed 5 percent of the weekly time set aside for instruction. I predict no great breakthrough in teacher use patterns at either level of schooling. (Cuban, 1986: 99)
>
> As events unfolded in the next quarter-century, my prediction flat-lined. Access to computers – desktops, laptops, hand-held devices and interactive white boards – soared. In writing *Oversold and Underused: Computers in Classrooms* (Cuban, 2001), I did find higher percentages of students and teachers using computers in preschools, secondary schools and universities that ruined my 1986 prediction. Since then, hundreds of thousands of students and tens of thousands of teachers across the country have received 1:1 laptops, tablets and white boards. In researching classrooms since 2001, again, I have found higher use by teachers and students in both elementary

> and secondary classrooms. More teachers – my guess is over 30% across different districts – use machines for instruction (I include the whole panoply of available hightech devices) regularly, that is, at least once or more a week. Another 30 to 40% use computers occasionally, that is, at least once or more a month. The remainder of teachers – still a significant minority – hardly ever, if at all, use machines for instruction. This continues to puzzle researchers and policymakers since they know that nearly all teachers have high-tech devices at home. So my 1986 prediction on teacher and student use of computers for classroom instruction was inaccurate and died a quiet death. Compassionate readers seldom remind me that I flopped in peeking into the future. The facts are clear that students and teachers use high-tech devices for instruction more than I had foreseen.
>
> One final confession. I stated clearly in *Teachers and Machines* and subsequent writings that the uses of new technologies for classroom instruction would seldom satisfy those advocates of more instructional use in schools, because teacher use would tend toward the traditional, blending both teacher- and student-centred approaches, and such approaches were seen as unimaginative. Not all teachers, by any means, but enough for the charge of uncreative teacher use to be commonly pointed out. Both of these predictions have turned out to be accurate … so far. (Cuban, 2010b)

I confess to my errors in foreseeing the future for no other reason than to remind readers, both champions and sceptics of computers in schools, that accurate predictions are rare and inaccurate ones are not only common but often memorable. So if I re-wrote *Teachers and Machines* (Cuban, 1986) today, what predictions would I make? I would predict that well over 90% of US schools a quarter-century from now will be age-graded and brick-and-mortar, not virtual ones. There will be much more blending of online and face-to-face instruction in classrooms as students get older – more of the latter in elementary schools and more of the former in secondary ones. Most teachers – at least 75% – will use some form of device regularly in parts of daily lessons because they have expanded their repertoire of teaching activities to achieve their goals for student learning. Those uses by teachers and students will be far more integrated into daily lessons, yet will still be criticized by that future generation of techno-enthusiasts as obsolete and unimaginative.

PJ: I would like to paraphrase one of my favourite titles (Cuban, 2003) on the long shelf of your books and end this conversation with a simple yet very important question: Why is it so hard to balance education with information and communication technologies?

LC: The question assumes that ICT is a separate force apart from formal age-graded schooling. In one sense ICT has been separate because policy elites (business, civic and political leaders) as well as vendors have lobbied local, state and federal decision-makers to introduce computer devices into classrooms and schools. These lobbyists for ICT have argued unrelentingly for the past three decades that ICT will modernize schools, strengthen the economy, alter traditional teaching methods, and increase the academic performance of US students. And

they have become increasingly successful as lobbyists for ICT. If anything, current spending on ICT has increased greatly in the last decade, suggesting an imbalance.

The reasons for the increased access to ICT are straightforward: the historic pattern of a decentralized system of US schooling – that is, nearly all 14,000 school boards are elected and fund their schools out of local monies. These local school boards have multiple goals to achieve in spending these monies and allocating staff, such as insuring that graduates are literate, can go to college or enter careers when they graduate, have embraced community values, get engaged in their communities and are independent thinkers. Such multiple goals and structures of local policymaking and funding guarantee conflicts among groups over how school dollars should be spent and the larger issue of civic leaders deciding how much money should schools get as compared to police, fire and other local agencies. The larger questions about what schools should teach, how teachers should teach and toward what ends schools should be aimed, may or may not be raised publicly, but answers to those questions vary among voters and policy elites.

All of this decentralization in a rowdy democracy makes tax-supported schools politically vulnerable to shifts in school goals and practices. With the centralization of state and federal authority over schools since the mid 1960s, local lobbying still occurs, but the pattern of topdown mandates from state and federal authorities (e.g. No Child Left Behind and Common Core Standards) occurs far more often and reveals again how politically vulnerable local public schools are. After all, what I call 'political vulnerability' non-educators and influential policymakers call 'democratic participation' by community leaders and their coalitions. And this is why ICT feels separate from education when, in actuality, it is part and parcel of what policy elites and voters believe teachers do daily in getting students to learn, with or without electronic devices.

The short answer to your question, Petar, is that for tax-supported schools, democratic politics mean that those who want teachers and students to have more and better access and use of ICT in classrooms compete with other interest groups that seek an upgraded science curriculum, less (or more) standardized testing, more (or fewer) charter schools, and judging teacher effectiveness on the basis of student test scores. That is why it is so hard to balance education with information and communication technologies.

CHAPTER 2

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

Conversation with Andrew Feenberg

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 philosophy of technology and to shaping contemporary science and technology studies. In addition to this work, he has extensively published on the Japanese philosopher Nishida Kitaro. 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 inquires digital education and ways of improving user experience. The fourth stream concerns the intellectual history of Western Marxism. Based on these four streams, 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* (1991) (a second edition was published in 2002 under the title *Transforming Technology: A Critical Theory Revisited*), *Alternative Modernity: The Technical Turn in Philosophy and Social Theory* (1995), *Questioning Technology* (1999), and *Between Reason and Experience: Essays in Technology and Modernity* (2010). His latest book, *The Philosophy Of Praxis: Marx, Lukács And The Frankfurt School* (2014a), was published less than a month before this conversation. Andrew's writings have been translated in Japanese, Chinese, Italian, French, Norwegian, Turkish, Portuguese and Spanish.

CHAPTER 2

ABOUT THE CONVERSATION

In September 2014 I emailed Andrew Feenberg and requested this conversation. His warm and positive reply arrived within minutes, and we immediately started working. The conversation was conducted by email in three batches of questions, and complete within less than a month. Andrew and I never met in person.

CRITICAL PEDAGOGY AND PHILOSOPHY OF TECHNOLOGY

Petar Jandrić (PJ): 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)

Please say more about the distinct features of your philosophy of technologies. Which messages from the Frankfurt School of Social Research are still relevant in our network society?

Andrew Feenberg (AF): 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 principal 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: Your recent book *(Re)inventing the Internet: Critical Case Studies* (Feenberg & Friesen, 2012) 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 'stabilised' 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 (e.g. Orwell's *1984* (1949) and Huxley's *Brave New World* [1932]), sometimes they are utopian (e.g. Bellamy's *Looking Backward: 2000–1887* (1960) [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 starting points for analysis of the contemporary Internet. Please generalise your 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 recognised 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, 2010a). 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 traditional 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. A decade later, Stiegler 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 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 *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 analysed 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). Please clarify links between technology and democracy. The Internet is a pretty anarchic medium in its own right. Why, for instance, instead of a democratisation, 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 *Democratising 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)

Could a democratic reform of technology, conceived within the present climate of global neoliberal capitalism, move against your prediction and take the right turn? What makes you so sure that capitalist democracy will not choose profit over the environment?

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. Can 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. Can you assess the role of technologies in the events of 1968 and draw a parallel between Paris in 1968 and recent 'Internet revolutions' such as the Arab Spring? Which messages from the past are relavant for (the role of the Internet in) today's social movements?

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 favourably 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 (Feenberg, 2015). 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 to 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 19th century America. Your example clearly shows that the competing social forces – boilermakers 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 19th 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 US where the basic decisions are still made.

PJ: Based on your reply, one may 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 20th century dissidents and revolutionaries. However, the Internet could also be a very powerful means for keeping masses off the streets. Please assess the importance of digital technologies for social change. 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 sceptical. 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). Can you 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? Can you analyse 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). 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 (Feenberg, 2008). 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? Can you tell us more about the thin line between the legal and the political?

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: behaviourism, cognitivism, constructivism … Controlled and monitored technologies downgrade traditional academic freedoms by transferring power from teachers to administrators, while open technologies contribute to democratisation 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? Can you analyse 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). Decades later, he was followed by

Richard Stallman's *Free Software, Free Society* (2002) and many others. In spite of developing a devoted body of followers, these proposals never gained wider traction. 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 US 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: Your writings strongly emphasise 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. Can you provide some directions for using digital 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.