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La technologie et les programmes : ombres et machines

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Aller au sommaire du numéro

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Résumé de l'article

De nos jours, l'influence de la technologie au sein des classes est indéniablement perméable et répandue. L'utilisation d'applications technologiques conceptuelles émerge d'un domaine des relations humaines largement politisé et déjà contesté. Cependant, cette contestation, lorsqu'étudiée dans le contexte des programmes, prend un tout nouveau sens. Dans cet article, j'énonce que la technologie, une fois introduite dans la sphère éducationnelle, crée des zones ombres sur le programme. Je soutiens que, même si certaines technologies semblent restreindre la capacité de l'apprenant à s'exprimer et expérimenter, ces restrictions ne sont en aucun cas absolues et inébranlables. En fait, considérer la technologie de manière esthétique équivaut à postuler l'existence de possibilités et sens alternatifs. Le potentiel performant de la technologie est considéré ici comme faisant partie d'un dialogue avec le programme comme expérience vécue, au coeur de laquelle l'apprentissage exprime son ambiguïté comme relation toujours fluctuante.

TECHNOLOGY AND CURRICULUM: SHADOWS AND MACHINES

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ABSTRACT. The influence of technology in today's classroom is undeniably ubiquitous and scattered, and though the practice of conceptualizing technological application emerges from within an already contested and highly politicized field of human relations, when approached in the context of curriculum, this contestation takes on new significance. In this paper, I construct a claim that, when introduced into the sphere of education, technology brings its own *curricular shadows*. I argue that while certain technologies seem to place restrictions on a learner's capacity for expression and experimentation, these restrictions are by no means absolute or immovable, and that to think through technology aesthetically is to posit the presence of alternative possibilities and meanings. The performative potential of technology is here considered as within a dialogue with the curriculum-as-lived-experience, where learning necessarily exclaims its ambiguity as a forever-fluctuating relationality.

LA TECHNOLOGIE ET LES PROGRAMMES: OMBRES ET MACHINES

RÉSUMÉ. De nos jours, l'influence de la technologie au sein des classes est indéniablement perméable et répandue. L'utilisation d'applications technologiques conceptuelles émerge d'un domaine des relations humaines largement politisé et déjà contesté. Cependant, cette contestation, lorsqu'étudiée dans le contexte des programmes, prend un tout nouveau sens. Dans cet article, j'énonce que la technologie, une fois introduite dans la sphère éducationnelle, crée des zones ombres sur le programme. Je soutiens que, même si certaines technologies semblent restreindre la capacité de l'apprenant à s'exprimer et expérimenter, ces restrictions ne sont en aucun cas absolues et inébranlables. En fait, considérer la technologie de manière esthétique équivaut à postuler l'existence de possibilités et sens alternatifs. Le potentiel performant de la technologie est considéré ici comme faisant partie d'un dialogue avec le programme comme expérience vécue, au cœur de laquelle l'apprentissage exprime son ambiguïté comme relation toujours fluctuante.

INTRODUCTION

> What of curriculum as itself a search for meaning? (Greene, 1995, p. 89)

Technology, like the unspoken assumptions of educational practice, is often encountered as a type of indeterminate "black box." Though we see its external effects and ostensibly witness its outward shell — at times with bursts of enthusiasm or shudders of trepidation — we hardly tread to the questions at the core: the psychic and corporeal inheritances enmeshed and glimpsed, yet generally taken for granted. Often seen as the governing scriptural arrangements of the educational domain, the meaning of that which we take as "curriculum" is also frequently contested; a term held by some to represent a dynamic and forever-fluctuating conversation, and by others as prescriptive policy. While the influence of technology and technological structures in today's classrooms is undeniably widespread, when taken up in the context of curriculum and pedagogical practice, this strange and scattered presence sustains a new species of significance, hardly straightforward or secure.

As educational historian Herbert Kliebard (1988) noted, "in any time and place, what we call the ... curriculum is actually an assemblage of competing doctrines and practices" (p. 19); and for curriculum theorist Ted Aoki (2005), "the term curriculum is many things to many people" (p. 94). Kieran Egan (1978/2003) has summed up the field of curriculum study broadly as "the study of any and all educational phenomena" (p. 16). When conceptualized merely as the documents and theories that legislate the transmission of teaching and learning — what comes before and organizes empirically the spatial and temporal trajectories of classroom life — the curriculum is undoubtedly situated as a fixed entity, imagined as something effortlessly applied. This linear movement, however, which imagines that learning has a fixed beginning and end, ultimately kills the curriculum's capacity for contemplating the complications of sociality, instability, and change, evading its vicissitudes as a "live tension" (Aoki, p. 362), whose pressure alerts us to the ways that experience should be viewed as a creative problematic and a complex endeavour, rather than simply as something that is given. This paper seeks to explore the influence that technology has on structures of classroom power, through which the curriculum itself becomes iterated and made manifest. In such moments, we can observe the ways that technology composes its claims on the bodies and minds of teachers and learners, effectively voicing its own curricular utterances in the interminable dialogue that is educational experience. I here draw attention not only to the manner in which technology functions in popular discourse — in reference to machines, computers, digital texts, etc. — but also to the idea of technologies of schooling taken more broadly; the ways in which objects and tendencies of the natural world (of which humans form a crucial part) are impressed upon by the epistemologies and assumptions of technological structure.

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As a way of framing this discussion in a manner that allows the concept of curricular shadows to interact with the world of educational practice in a material fashion, I will begin by introducing an episode from my own educational past as a high school student, which despite — or perhaps because of — its quotidian and trivial nature, touches on some of the important dynamics in the relation of education and technology. As the past itself acts as a shadow on the present, influencing the shapes we see and the world we project, I move back and forth here in an act of creative remembering, and, as I remember my fractured nature in mid-adolescence, I also appreciate that such acts of remembering are themselves endeavours forever fractured and fracturing. In regards to the trope of the curricular shadow — and though I consider it significant that, in operating under cover of shadow, shapes are notoriously difficult to pin down and delineate — I recognize that such an idea only makes sense if some type of reference is made to the object (whether cultural, historical, psychic, or otherwise) that is responsible for the shadow's casting in the first place. While I dispute the notion that this casting of curricular shadows might derive from any one foundational location (whether education's own past, a teacher's hopes, or a student's desires), my hope is that the incident I relate works to illustrate the play that is inherent between the relation of a shadow and its object, between the curriculum as an abstraction and as a lived reality. Throughout this paper, I thus make repeated reference to this initial encounter, in a manner that is intended to render intelligible the subsequent threading-through of my argument.

The particular episode that I wish to explore concerns a class that fell immediately after lunch, and as any teacher would agree, there are no infallible methods of making new meaning from the energies and antics of the lunch hour, itself an organizing technology. During this gap time of the school day, students invariably make certain decisions dictated by their needs and desires alone, rather than those of teachers and educational administrators. As there is a degree of student freedom in the lunch hour, the contradictions that arise from layering this space of fewer fetters onto that of the institutionalized classroom can often lead to jarring and strident events and invectives. In fact, this time of day forces the awkward question: "To whom does the classroom belong?" More often than not, it is seen as the teacher's space *par excellence*, in which students are generally tolerated only so long as they are composed and respectful (though, having also worked as a high school teacher myself, I realize this is far from the whole story).

As I would enter this particular class, I would often stealthily sneak over to the classroom stereo system, which was located in an unlocked cabinet, and slip in some music undeniably at odds with the approaching lesson — Black Flag, The Geto Boys, Born Against, Napalm Death — cranking the volume knob all the way up, prompting a sound I considered indisputably repellent to the adult ear. I would then shut the cabinet doors, and move swiftly to

my desk. As the teacher went to turn the stereo off, she would be forced to open the cabinet, which had muffled much of the music, to a sound that was thunderous and almost material. Surprisingly, this teacher also repeatedly made the choice to forgo any kind of reprimand, directing us, instead, straightaway to the day's lesson. Even though she ignored my provocation — a perversion of various classroom technologies — the balance of classroom power was nevertheless distinguished as a negotiable thing, where, through making use of the classroom space and its related technologies, a student might insert their own commentary on the often-incontrovertible fact of pedagogical authority. As I understand it, the teacher's disregard was a silent announcement; a sort of unspoken acquiescence.

The technologies of schooling involved here are numerous, and the assumptions they carry are many: the temporal and spatial splitting off of the school day, the placement of desks, the wooden cabinet and its unlocked doors, the stereo system, the rules and knowledge of discipline, the expected roles of student and teacher. In this configuration of folding and bisecting technologies, commentary, no matter how absurd or seemingly innocuous, is often all that is needed to show a chink in the armour. This gap and crevice, a trace of curricular shadows, is an invisible commentary whose presence is often ambivalent and unspoken, yet also inevitably discloses potential.

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When the materials of learning are neatly separated, in theory, from the moments of learning (in practice this is always an impossibility), something important is being lost in our imaginings of what learning is and what it could be — whether knowledge stands as complete and fixed, or as something accessible that we can touch and transform. The basic and quotidian material technologies of learning — whether pencil, textbook, desk, chair, cabinet, stereo, computer, soccer ball or hallway — which in themselves and their historicity are really not so basic, are here understood as neither dead nor inert. Like the learner's own capacity for engagement with new and sometimes difficult knowledge, technological objects — and the spaces they occupy — carry traces of past situations, whether from five years or five minutes ago, foisted on the conditions of present pedagogy, marking their trail in a forward futural motion. They bring their own curricular tones and shadows, whose substance is certainly far from neutral. In this manner, Aoki (2005) wrote of the "curriculum-as-plan [as] the work of curriculum planners," and that "as a work of people, inevitably, it is imbued with the planners' orientations to the world ... their own interests and assumptions about ways of knowing and about how teachers and students are to be understood" (p. 202). Technology, as an instance of some such constructed material, when implied in the classroom — with both an identifiable *and* what we might call an unconscious history of use and design — is therefore not a dead or silent thing of exhausted possibility, or just a user-friendly tool absent

of any epistemological influence. The questions I am presently posing, then, concern the methods of organizing and understanding the world that technologies carry and suggest, the types of conclusions and consciousnesses they cultivate and desire, how we position ourselves towards them in the networks of pedagogical practice, and as Bronwen Low (2008) put it, "the ways youth are reading and writing their worlds" (p. 145). Similar to the manner in which Wen-Song Hwu (2004) took up Jacques Daignault's concept of *composer* to articulate relations of *expressing* as a "present, ongoing process" (p. 197), the student, in *expressing* their subjectivity, might also compose claims that play off and through the teacher's composure, and off and through various folds of technological landscapes. For teacher and student — each of whom is forever vulnerable towards the other — such play is multiple, nomadic, interminable, and always unforeseen; the point, as Hwu noted, is "to *multiply* the definitions, to invite a plural spelling" (p. 183).

UNDERSTANDINGS OF THE TECHNOLOGICAL

There is no denying that the influence of technology in today's classroom is ubiquitous and scattered; both in terms of how pedagogical material is composed, compiled, and presented, and also with regards to the devices and knowledges that students themselves bring to situations of schooling — a familiarity that often strips the veneer of learning as a route with only one path, as direct communication from teacher to student (indeed, when it comes to certain technologies, the student often knows more than the teacher). The period of questioning whether to allow technological objects such as computers into our schools has passed. The questions must now be posed differently. "The new technology is here," Michael Apple (1988) noted, "it will not go away" (p. 307), and this statement is as true now as when he first composed it. Technology, however, is always "more than its tangible products" (Pearson & Young, 2002, p. 2), and should therefore not be defined simply by its physical manifestations in high-tech, machined, and industrial invention, categories of use that are themselves hardly secure. As we can see in such an infinitely emergent field as "new media," with its continuous lack of a settled locus, there is a "terminological instability" (Zylinska, 2009, p. viii) to the very notion of technology. Understood broadly, the practice of technology, as I here define it, is that which sees humans modifying the products and contingencies of "nature," or that which is taken as "natural" in any given context, to meet their needs, through the use of various artefacts, languages, tools and devices. In this, as Andrew Feenberg (2006) put it, "technology is concerned with usefulness rather than truth. Where science seeks to know, technology seeks to control," to which he also adds the caveat that "this is by no means the whole story" (p. 5). In fact, our definition of technology also includes a wide range of knowledge and prospects for knowledge production, including the cognitive processes involved in the manufacture and operation of technological equipment, and

the mathematics, grammar, syntax, affective attachments, and aesthetics of design. For Judy Wajcman (2009), technology is "a seamless web or network combining artifacts, people, organizations, cultural meanings and knowledge" (p. 106). It includes, therefore, not only what we use in the classroom, but also the reasons why we use them, the histories of their use, and the explicit and implicit principles governing our relations with them.

But to broadly define technology is not enough, for we have still have not made any substantial claims about its consequences over and with everyday human interaction. The conceptual approach that I take toward the potential effects of technology is one of ambivalence, and which points both to its faults and, also, to its possibilities; as something that "frame[s] not just one way of life but many different possible ways of life, each of which determines a different choice of designs and a different range of technological mediation" (Feenberg, 2006, p. 13). As such, my views regarding technology are not unreflectively optimistic or pessimistic, but proceed with a sustained scepticism regarding its purported uses for seemingly democratic, or emancipatory, purposes; though we should also be careful not to exclude the possibility of such interventions from the outset, a qualification that becomes especially important when looking at the context of educational spaces.

In understanding the curricular influence that technology brings to education — the shadows it casts on the nature of learning — and given that technological outcomes are never known in advance, the presence of technology is best seen as something not immediately dismissed *or* automatically welcomed. Since, "in classrooms ... curriculum becomes a social practice" (Pinar, Reynolds, Slattery & Taubman, 1996, p. 744), the encounters that teachers and students have with technology offer a unique vantage point from which to assess the sociality of learning as an endeavour influenced by multiple and fluctuating points of entry and engagement. If we think back to the story that frames this discussion, the meaning that is produced from the encounter of music and school, student and teacher, time and space is far from unambiguous, but what *is* clear is that the creation of meaning, in educational spaces, is necessarily an ambivalent process, forever renegotiable through various technologies, the values they bring, and the imprints that humans inscribe in their use.

Technology in the classroom, a description of the discussion

Inquiring ethnographically into the influence of technology in Los Angeles' public schools, Torin Monahan (2005) described the persistent and powerful mythologies that have all but permeated the rhetorical field. Firstly, he wrote that the dominant view of technology that he has encountered in the course of his research is one that can be generally characterized in deterministic terms, "as advancing in unidirectional evolutionary fashion" (p. 183). From this point of view, to question the advance is to unwittingly situate oneself as questioning the inevitable and as resistant to the necessary nature of change

and technological evolution. Secondly, Monahan wrote that technological objects are usually positioned simply as *tools*, as instruments of use whose objective neutrality is simply beyond question. From this point of view, the sole purpose of a classroom's stereo system is to further the ends of learning as outlined through official channels. Any other use would, therefore, simply be a perversion. Lastly, these objects are often construed as "universal correctives to social inequalities" (Monahan, p. 183), whose social benefits for students and teachers — in regards to literacy, the job market, and keeping up with the competitive challenges of a changing and globalized world — far outweigh any possible negative consequences. This is similar to Herbert Marcuse's (1964/1991) conception of the "Happy Consciousness," which operates according to "the belief that the real is rational and that the system delivers the goods" (p. 84). Even though, as consumers and users, we may be aware of the harm that could eventually accrue from a purely rational vision of technological unfolding, it might nevertheless be psychically easier to focus only on the categorically advantageous.

For Monahan, the danger in the perpetuation of such myths lies not in their assumed veracity, or their claims as transcendental truth, but in their ideologically-inflected rhetorical thrust toward "a literal reign of silence" (Feenberg, 1999, p. 101); that by means of the assumed neutrality with which technologies are invested, "they deflect inquiry into emerging power differentials" (Monahan, p. 183). In other words, if we insist that the figure of the teacher is the only arbiter of whether or not a technological object, such as a stereo system, is used correctly, we mask the potential for technology to be taken up in ways unprescripted by the traditional balance of classroom power. Sometimes the unnecessary is simply the unintended, while the accidental might always have more value and use than the anticipated.

In positioning technologies as apolitical tools, they are construed as invariably flexible objects that can easily adapt themselves to individual needs, understood as conceptually distinct from the social matrix of human relations and systemic inequalities. Such a rhetorical move works to shut down alternative considerations by appealing to a common desire, which, as humans, we all possess, for some sense of control over our surroundings. By exclaiming that technology is only a tool, we distance ourselves from the technological choices we enact and their social consequences, while also seeking to confirm a guarantee of human agency as something sustainable; "that *we* are in control, not our machines" (Robertson, 2001, p. 14, emphasis in original). Against this assurance and false pride, I agree with Langdon Winner (1986), in his classic assessment, that tools are never neutral, but since they inevitably tolerate particular movements and disallow others, have a number of political qualities built in. For though the tool, seemingly immobile and passive without the endowment of human touch, may appear as naturally innocent as a rock or a blade of grass, it shapes and enacts a disciplinary pressure both on the tasks

at hand and on its users; in actuality, "the doer is transformed by its acts" (Feenberg, 1999, p. 206). The tool motivates certain decisions that might otherwise have remained unthought; for not only is it true that, "hammers don't work well with screws," but "when you are carrying around a hammer, everything starts to look like a nail" (Robertson, pp. 14-15).

To segue into a discussion concerning the ideological implications of technology and education, I will here turn briefly to Alfred Borgmann's (1984) writing on the "concealments" embedded in technological devices. In his analysis of what he labeled "the device paradigm," Borgmann argued that as machinery becomes understood in its nature as device and commodity, it necessarily masks its inner workings. As we come to expect technological devices to appear to us in their capacity as *function* — ready-made and ready-to-use, "without the encumbrance of or the engagement with a context" (p. 47) — we lose a sense of the burden normally associated with the often-unpredictable nature of non-commodified relationships.

This idea resembles Martin Heidegger's (1977) argument regarding the dangers of modern technology, through which humans are charged with positioning objects in the natural world, such as rivers, as a type of "standing reserve," which implies that they are ready to be ordered about and called to deliver. For Heidegger, this danger is further complicated by the fact that humans don't recognize the ways in which they themselves, in their ordering of what they consider to be a "standing reserve," become simply another type, a different category, of this same "standing reserve." When things are ready and arranged, without us even having asked them to be, we generally don't find the need to question why or how; we have other things on our minds. For Aoki (1987/1999), who adopted a Heidegerrian questioning in relation to computer application, in assuming his position as the "orderer of this 'standing reserve' ... man tends to be forgetful of his own essence;" he thus endangers himself and his projections for the future, "no longer able to encounter himself authentically" (p. 170). If, as William Pinar (2012) noted, technology represents a potential "concealment of reality" (pp. 135-136), and if, "in bringing reality into conformity with our dreams, reality disappears" (p. 143), then we can also ask whether, through this dismantling of reality, we are not also disavowing our dreams as well. As the dream is only the fulfilment of a wish in relation to reality, without reality, the dream disappears: *it has no subject*.

On this point, Borgmann wrote how, "the concealment of the machinery and the disburdening character of the device go hand in hand," since "a commodity is truly available when it can be enjoyed as a mere end, unencumbered by means" (p. 44). In this process of commodity production, through which the ends and the means that collectively form a context are severed and masked, one extolled and decreed as useful and the other as unnecessary and veiled, Borgmann illustrated his point through invoking the case of "technologically

transformed wine" (p. 49). In this example, the prestige conferred to particular types of wine is directly related to their *terroir*, their *provenance*, and their embodied historicity. Tasting a wine distinguished with such qualities is thus to taste more than simply a liquid that makes you light-headed and giddy, it is to taste in the ends a sense of the means. For Borgmann, "the world that is opened up in wine as a thing is closed off when it becomes machinery and commodity" (p. 49). From this understanding, the significance of such an immediately consumable product as box-wine is purely function and value, and bears no traces of the soil from which it was birthed.

While I do not want to extend this metaphor onto precarious ground, I am here motivated by the perils involved in qualifying education as an activity obsessed with the ends, concerned solely with the acquisition of data, and as something "technologically transformed." If the tool sculpts, even in some small way, the task at hand and its users, and "to consume is to use up an isolated entity without preparation, resonance, and consequence" (Borgmann, 1984, p. 51), then a curriculum that regards knowledge as—in its essence—something commodifiable, as linear data and textbook facts, also composes its claims on the learner *as* a specified type of inert body. For Heather-Jane Robertson (2001), something is skewed in this process that separates the learner from embodied histories of knowledge, and as she wrote, "skewing relationships means skewing the very guts of education" (p. 35). To put it simply, the meanings attributed to the action of a student or a teacher—opening or closing the cabinet doors, choosing to discipline or ignore—or to any activity whatsoever within the space of education, is determined by more than simply the end result. Meaning is as much a matter of perspective as it is a matter of history and of possible perspectives in history, many of which are drifting and vagrant, forgotten and left to the movements of time.

Curriculum conversations

But the question still persists: if the presence of technology in the classroom is not simply there as a tool, then in what capacity does it make its presence felt? As I have been arguing thus far, the import of any form of technology into the educational sphere is *always* the import of a curriculum, or what I refer to as a curriculum shadow, overlaid on, and bisected through, the one already present and lived into existence. Such a shadow impacts on the meaning/reading of space and time in the classroom, and brings the student and teacher into a dialogue with past, present, and projected pedagogical iterations, both from within the self and without. In this negotiation, the act of teaching, in its selection of curricular materials, and its inclination toward and through sets of pre-existing knowledge, is itself an inherently political act. For Apple (1990), in his desire to "see education relationally" (p. ix), dialogue about what *does*, and what *should*, take place in classrooms ought to always proceed with an awareness of the politically situated nature of the tasks of teaching and

learning as "caught up in the real world of shifting and unequal power relations" (p. viii). Clearly, as structures of institutionalized schooling are *de facto* spaces of embedded cultural reproduction, to analyze their activities as from within some sort of social vacuum would be to ignore their integral connection to the cultural, political, and economic institutions of the larger society in which they are located, institutions that may themselves be discriminatory on the basis of gender, race, class, sexual orientation, or age.

In "the technologized classroom" (Apple, 1988, p. 297), there is often an emphasis on that which is changing, and locating modifications, *in degree*, as authentic transformations *of kind*, and, rhetorically, as innovation, progress, improvement, and advancement. As Apple notes, this emphasis on difference distorts our understanding of what is really taking place, since "by focusing on what is changing and being changed, we may neglect to ask what relationships are staying the same" (p. 290). Whether learning is accomplished through means of a stone tablet or an iPad, or whether classrooms are framed by walls or windows, is not as important as the problem of whether the actual structures of the pedagogical relationship are themselves thrown into question. In this context, and with the articulation of technological change often steeped in an historical myth of predestined progress and "the inevitable present" (Monahan, 2005, p. 46), Apple's (1990) set of classic curriculum questions must here be enunciated anew. Only when such questions can be effectively responded to can we even begin to classify technological change, or *innovation*, as actual improvement or betterment: "Whose knowledge is it? Why is it being taught to this particular group, in this particular way? What are its real or latent functions in the complex connections between cultural power and the control of the modes of production and distribution of goods and services?" (p. 156).

Since the form and content of technological objects carry the potential for transmissions of an ideological nature, the question that must be posed in the present context is: How does ideology, as a facet of technology *as* curriculum, function; and what does it bring? As Monahan (2005) described it, "technologies alter the very composition of educational institutions ... hardwiring new power relations" (p. 2), and "operat[ing] as extensions of space" (p. 8). Monahan introduced the concept of *built pedagogy*, as the lessons that technological spaces teach us, "through affordances that privilege certain movements, activities, or states of being over others" (p. 34). Though of course, since the effects of teaching are never in simple correspondence with the effects of learning, while the ends of *built pedagogy* motivate, they do not necessarily determine. In a manner akin to Aoki's (2005) "architectonics of the curriculum landscape" (p. 201), Monahan points to the psychic imprints that develop in the socio-spatial construction of "teaching bodies what should and should not be done in silent, subtle, and insistent ways" (p. 34). The question for Monahan is not what technologies can and cannot do as tools or means

of instruction and evaluation, but "what social relations do they produce?" (p. 52), and, in the saturation of technological space and the "shap[ing] of human comportment" (Michael, 2006, p. 53), what forms of consciousness are effectively created and recreated?

Perhaps a more apt line of questioning, in this "disturbance of the curricular landscape" (Aoki, 2005, p. 204), would proceed not only to what technology *brings* to educational spaces, but what it *hides*: "what lies beneath the surface?" (Apple, 1990, p. xv), which types of knowledge are legitimized and which are delegitimized (Streibel, 1988)? In its often unspoken diffusion, technology brings a buried, latent, and "hidden curriculum," here defined as "the tacit teaching to students of norms, values, and dispositions that go on simply by their living in and coping with the institutional expectations and routines of schools day in and day out for a number of years" (Apple, 1990, p. 14). Regarding the nature of technological objects, where "functions are not intrinsic to the artifact" (de Vries, 2006, p. 21), this notion of embedded concealment is a question of design and distance, through which degrees of control by the maker or designer remain invisible yet present still. In educational practice, this notion includes the dangers implicated in the abstracting tendencies of technical and formulaic languages of learning, what Aoki (2005) has called a "striated language of ends-means ... written for faceless people in a homogenous realm" (p. 207).

What should be remembered, though, and which points to the possibilities of viewing technology as other than simply ideologically-inflected, is that the relation between user and designer, as lived out in the social reality of technological use, is never stable or fully pre-determined (Ihde, 2006). Similar to Michel de Certeau's (1984) understanding of reading, as an act where "everyday life invents itself by poaching in countless ways on the property of others" (p. xii), Tim Ingold (2006) has written of our relationships with technical objects as narrative-based, and that "to name a tool is to invoke a story" (p. 71). Ingold enunciated the similarities between tool-use and the narrative art of storytelling, wherein the implications and purposes of both are highly contextual and open-ended, and can only be meaningfully approached in their *use*. For a student to take up a pen (or to blast Napalm Death from the classroom stereo), and whether they do so of their own initiative, is a very different thing from compulsory moments of creative writing and the tracing of marks originally sketched by the teacher. Efforts to compose oneself creatively, in a space where the limits of correct composure seem firmly entrenched, nevertheless always preserves a sense of the possible that exists beyond the given. Both the given and the possible depend largely on the circulation of situational and environmental factors, and the constitution of consumption: how the reader/user/teller/writer is positioned in a social network. In this context, where "the text has a meaning only through its readers [and] it changes along with them" (de Certeau, p. 170), users/readers/learners bring their own stories to bear on the

conversation as well, presenting a unique opportunity to access the meaning of design, and the meaning of knowledge and educational experience, as something truly in flux. In appreciating a tool as an object with a storied history, Ingold wrote of the rhythms that arise in tool-use—as exclamations of embodied interpretation—not as monologic, monotonous and mindless, but instead, as carrying a "specific resonance ... in an environment where nothing is quite the same from moment to moment" (p. 76). In this context, Ingold instils the user with an agency and aptitude for learning not typically encountered, which positions the student as an integral component of, and player in, the socially embodied "contest of interpretations" (Feenberg, 1999, p. 84).

In re-envisioning the possibilities of technology in the educational sphere as something other than wholly negative and disempowering, it will also be helpful if we touch on Aoki's (2005) "folded view of curriculum" (p. 322). As mentioned previously, there are no straightforward understandings of what curriculum is or should be, though when brought up in relation to mandated programs of study, and the drafting of lesson plans and study guides as conceptual contracts, it designates the disembodied nature of the "curriculum-as-plan," what for Aoki is "an abstraction yearning to come alive in the presence of teachers and students" (p. 231). The pedagogical situation, however, which runs the gamut from test-taking to the manner in which a student enters a classroom after lunch hour, is never one of strict correspondence, and consists of a forever negotiated "living in tensionality" (p. 159), as teachers and students find themselves "indwelling" (p. 159), sometimes precariously, in between two separate spheres of curriculum demands, which themselves passionately resist integration. The first is that of the preplanned, instrumental understandings of the curriculum landscape, which operate in a "fiction of sameness," and wherein "teachers are asked to be doers" (Aoki, p. 160).

Apart from this exceedingly normative framework, the second mode is the mode of curricular being that can only be articulated in the ambiguous and embodied potential of classroom experience. Referred to as the "curriculum-as-lived," this situated curriculum consists of the unpredictable, the improvised, the "unplanned and unplannable" (p. 322). Teachers, though, cannot choose to occupy one curriculum field over the other, and must forever reconcile themselves and their material situations anew, acknowledging the tension that comes from "living simultaneously with limitations and with openness, but also that this openness harbours within it risks and possibilities as we quest for a change from the is to the not yet" (Aoki, p. 164).

From this vantage of the curriculum landscape, we are presented with a "hermeneutic problem of the relationship between the general and the particular" (Aoki, 2005, p. 155), between the mandated and the lived. To think of technology instrumentally, and only in its capacity as an abstract "application," or as the reproduction of a predetermined set of generalized principles

in particular situations, is to ignore the Gadamerian fusion of horizons, the clashing of desires, and the meeting of worlds that determines classroom experience. For "what the situation demands must not be ignored" (Aoki, p. 155), and in Aoki's view, technology must be understood in its forever-fluctuating relationality, and at every moment in a new and different way, in "a tension between the appearance that presents immediately to us and that which needs to be revealed in the situation" (Aoki, p. 156).

Since "the task of application" is here understood as a "dialogue between the language of ... technology and the language of the ... education situation" (Aoki, 2005, p. 155), Aoki's approach to bilingualism will also help us to further appreciate this dialectic. To venture conceptually into the sphere of a second language is not here put forward as simply a technical task of appropriating a linguistic code, but a circular and hermeneutic endeavour of "being-and-becoming-in the world," and to "belong to two worlds at once and yet not belong to either completely" (Aoki, p. 243). Admittedly, I'm here taking up the idea of language broadly, and as itself a type of communicative technology. Thought in this way, the statements that are prompted by a student's actions, such as entering the classroom and appropriating the stereo, have a communicative, though not necessarily linguistic, function. The practice of being and becoming bilingual is thus to live in a similar tension to that of someone who uses technology — to stand engaged in a dialogic dialectic, of questioning between the known and the unknown, and with "an understanding of education as a leading out and a going beyond" (Aoki, p. 243). This is a position of unknown possibility that is often ambiguous and difficult, though which also holds a potential that can be transformed, accessed, and harnessed — in no insignificant way — by the user's own intentions, intuitions, knowledge, and history. For the teacher and the student, to stand and face one another, to press play and stop on the stereo, is to operate in (at minimum) a field of bilingual intention, for teachers don't always speak the same languages as their students.

Possibilities for technological manipulation: Animating the shadows

As I have outlined thus far, when thinking of education as a task without distinguishable *means*, or whose inner workings, ambiguities and motivations remain uninterrogated or thought of in context, there remains the danger of shutting down possibilities and alternatives in favour of a kind of predestined technological determinism. In regards to the corporeal and psychical curriculum impressions that technology leaves on educational spaces and participants, it now must be reckoned that forces of influence in both pedagogical and technological relations work multifariously: as both constraints on and endowments through relations of power, and in always more than one direction; subjective relations that create subjects, but that also endow these subjects with power. Moreover, the users of technological objects (whether virtual or otherwise,

student or teacher, young person or adult) always possess the potential for moments of resistance in consumption as an active practice: in manipulation, manoeuvrability, perversions and reimaginings of time and space, and the triggering of unintended consequences and alternate functions. If "technology is power in modern societies" (Feenberg, 1999, p. 131), and if the orientation of power is never something that is fixed, then it is worth inquiring into the means by which power can be accessed, as Maxine Greene (1995) put it, by those "feeling [themselves] on a kind of verge ... to carve a space in which [they] can break the peculiar silences and choose" (p. 117). Above all, this is a tension between desire and constraint, and of individual and social struggles to subvert a given law, reminiscent of the fact that, as Deborah Britzman (2003) wrote, "there are always two simultaneous dimensions of social life: the given and the possible" (p. 222). The important question, then, is how desire—despite its predilection to that which is perverse and elusive—is made manifest.

Though it might often seem otherwise, the trajectory of the "tactics of consumption, the ingenious ways in which the weak make use of the strong" (de Certeau, 1984, p. xvii) is never fully foreclosed. To revisit de Certeau, the impulses of consumption — a "secondary production" — are devious and scattered, though also powerful in their ability to insinuate themselves silently in the "network of an antidiscipline" of the everyday (p. xv). In the social conduct of living amongst others in disciplinary spaces, and where order and presupposition are "tricked by an art" (p. 26), de Certeau provided the example of what in the language of French factory labour is called *le perruque*, or "the wig," a false front put over on what is otherwise presumed as "necessary" and "natural": "the worker's own work disguised as work for his employer" (p. 25). As the student who scribbles notes in the margins of her notebook to herself, whether nonsensical doodles or deeply subversive tracts, or who uses a technological object in an unintended fashion — deliberately or not — but who otherwise appears immersed in the task handed down to her from others, this "esthetics of '*tricks*'" and "ethics of tenacity" point to always available resources "in the very place where the machine ... reigns supreme" (p. 26, emphasis in original). Though, as an adolescent, I may have been subscribing to many of the mandates of being a good learner, I learned early on that there is more than one way to skin the cat called school. In territory that can never be fully claimed as her own, the student can nevertheless always insinuate traces of her use on the structure of pedagogical objects and spaces — provocations of consumption that shift from notions solid and certain, to those invested with energies dynamic, fluid, and creative.

In this ambivalent relationship through a "margin of maneuver" (Feenberg, 1999, p. 113), the instrumental division between producer and consumer in the pedagogical sphere — where students and teachers are simply "stomachs or furnaces" and "don't create [since] someone else does that" (Apple, 1990, p. xiii) — is rendered ridiculous. In the gathering of education and technology,

as a space of aesthetic possibility "brought to life through performance" (Low, 2008, p. 129), Low wrote of how, motivated by the creatively transgressive ethos of Hip-Hop culture, young people "have seized control of some of the information and communication technologies" responsible for their very marginalization, "and reworked them into tools better able to express their experiences" (p. 130). From this understanding, my engagements with the stereo may have expressed a desire for interaction, perhaps to expressively mourn the passing of the lunch hour, a swan song for a kind of quotidian death.

Though her theorizing around a "poetics of technology" does recognize the historic subjugations, exclusions, and built pedagogy in contemporary technologies, Low also found "at the intersection of technology and language" (p. 132) — in expression and use — an arena for identificatory multiplicity and, more importantly, "a means of resisting unwanted demands and oppressive roles" (p. 144). In Hip-Hop *turntablism*, for example, the "scratch" is the strident and celebratory announcement of a chance encounter, an interruption, and a mistake. Through the embodiment, in the rap text, of technological interventions as "intentional misuses" (p. 132), with the imprints of the user scrawled as a smudged fingerprint on an otherwise technologically oriented space, it "makes rap a self-consciously flawed and fallible art form" (p. 133), and makes of technology not only an alienating force, but a useful tool in rethinking that which might otherwise be presumed as given or inalterable.

In this conduct of play and experimentation, at its heart a rebellious mode — though at times institutionalized and codified, always along with the possibility that it could be otherwise — these intrusionary "poetics of technology" reveal the mythic nature of digital stability, insinuating, instead, "that the information age," in which we find ourselves, "is a very noisy one ... in which people are addressed, invited, enticed, and coerced in a historically unsurpassed diversity and volume of forms" (Low, 2008, p. 138). What technology brings to the pedagogical situation, then, is hardly ever only one thing, but always a potential multiplicity, a planned structure — resistant to change but nonetheless malleable — taken up and played out (perhaps perverted) in the curriculum-as-lived-experience. The pedagogical travels of teachers and students in the context of their social lives and mediations are hardly impenetrable and inevitable affairs, and with young people as possible producers and distorters of an inherited script, they can always be roused in their learning and encouraged to claim it as their own, engaging "a certain art [in] placing one's blows" (de Certeau, 1984, p. 18).

The curricular shadows that technology brings, then, and its methods of organizing and understanding the world, can at times not only allow, but also inspire, an improvised and deeply imaginative aesthetic contamination. And far from being simply a regression or sign of incapacity, such contaminative energies might be a provocative, brash, progressively defamiliarizing, inter-

ruptive, and even at-times offensive, conceptual corridor to spaces of actual participation in everyday educational affairs. The shape that such involvement takes may be as explicit as an appeal put directly into words, or as concealed as the shape of a student's strut, or the appropriation of a classroom stereo. To be cognizant of the value of emergent technologies, the point is to remain open to possibilities and shapes that we might not yet recognize, and to allow that what we perceive today as the monstrous or problematic might tomorrow point to a better world, or at the very least, to an alternative way of looking at each other.

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