

# TOWARD A THEORY OF NEGATIVITY

## TEACHER EDUCATION AND INFORMATION AND COMMUNICATIONS TECHNOLOGY

**Heather-Jane Robertson**

Canadian Centre for Policy Alternatives

*Teachers are vulnerable to the technopositivist ideology that perpetuates a naïve faith in the “promises” of technology. Most teachers have been denied opportunities to explore the motives, power, rewards, and sanctions associated with the unscrupulous marketing of information and communications technology (ICT) and tend to be uninformed about the research that has failed to find a positive relationship between ICT use and student achievement. They remain unaware of the efforts to disguise how devotion to technology necessarily entails retrofitting the purposes and practices of education. This article examines technopositivism as a marketed ideology and follows the marketing strategies that appropriate and redefine educational goals and problems. It explores the alleged link between constructivism and technology and considers how teacher education and standard-setting bodies perpetuate this contestable association. Finally, the article suggests some deliberately critical questions that can be legitimated only if posed by teacher educators.*

**Keywords:** *information technology; constructivism; education; teacher education; commercialization*

For the past 5 years, I have written a regular column for *Phi Delta Kappan* magazine on current issues in education as they are played out in Canada. My January 2003 column was titled “Recycled Promises.” It took aim at an article contained in a glossy magazine that had been inserted into my daily newspaper. A little Web sleuthing revealed that the magazine had been distributed to those least in need of handouts: households in neighborhoods where average annual incomes exceeded \$87,000. The article that caught my eye promised to provide the answer from “research” to the question “Does technology really make a difference in student achievement?” The imprimatur of the government of Canada appeared throughout the magazine, a sign that my tax dollars were funding the dissemination of educational research to the movers and shakers, the opinion leaders, the

folks who matter—or at least the folks who invest.

However, my excitement cooled when I saw the familiar Apple logo all over the article, which was called “Classroom Computers = Remarkable Results” (Apple Computer, Inc., 2002/2003). The lead’s direct question about technology’s contribution to student achievement was parried by a cleverly indirect answer: “At Apple, we believe the effective integration of technology into classroom instruction can and will result in higher levels of student achievement” (Apple Computer, Inc., 2002/2003, p. 41). Note how skillfully “research” had been transformed into a belief system and how conveniently the future tense had been substituted for the past and present. Technology “can and will” rather than “has and does.” The future requires no footnotes.

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The promised summary of research findings condensed six (American) studies into a half page of big font and broad generalizations: "Studies have shown that students with routine access to technology learn . . . basic skills faster and better when they have a chance to practice them using technology" (Apple Computer, Inc., 2002/2003, p. 42). Apple's summative report on its Apple Classrooms of Tomorrow (ACOT) project (Sandholtz, Ringstaff, & Dwyer, 1997, page unspecified), was cited as the source for this assertion. Coincidentally, this was one document I knew well because I had previously addressed its particular claims and tracked ACOT's substantial influence on thinking about information and communications technology (ICT) in schools (Robertson, 1998). I had examined this report from both pedagogical and political perspectives, including why a project such as ACOT would be funded, in part, by the New America Schools Development Corporation. New America Schools Development Corporation's members include AT&T, IBM, and the American Stock Exchange, each committed to the shared goal of "better alignment of American schools with American business objectives" (Robertson, 1998, p. 131).

Student achievement was discussed in some of the early ACOT publications, including Number 7, *ACOT Evaluation Study: First and Second Year Findings* (Baker, Gearhart, & Herman, 1990). The explicit purpose of this study was to evaluate achievement among students exposed, in ACOT's words, to "unlimited access to technology." (I have searched, unsuccessfully, for research on the impact on student achievement of providing students with two years of "unlimited access to teachers," although the proposition is intriguing.)

Presumably, the standardized achievement tests that were administered to students in both ACOT and control classrooms as part of this study yielded data, although Apple chose not to report the results. Instead, the authors (or head office) prepared this rather artfully worded summary:

Results showed that ACOT students maintained their performance levels on standard measures of

educational achievement in basic skills, and they sustained positive attitudes. . . . The ACOT program was at least as effective in promoting commonly measured student outcomes . . . and in at least one site there were indications of advantage for ACOT students. (Baker et al., 1990, p. 4)

Thus, after 2 years of total and unlimited access to technology by carefully selected students whose parents had chosen the program and whose teachers enjoyed unlimited amounts of technical and instructional support, small class sizes, and half of each day to devote to preparation, the best that Apple could say about the achievement scores of ACOT students was that they had not declined.

The authors insisted that it would be premature to infer anything about the effects of technology on student achievement and predicted that more robust results would be released in subsequent monographs. However, student achievement soon disappeared as a subject of inquiry—or at least as the subject of the remaining ACOT-published literature. Apple's final report (Sandholtz et al., 1997) does claim that some ACOT students "scored significantly higher" (p. 40) on California Achievement Tests, but only a 1987 Memphis school newsletter is cited as evidence. Something tells me that if additional or more conventional data supported Apple's claims for improved student achievement through technology, the corporation would not have been shy about trumpeting the results. Certainly, there is no evidence that Apple attempted to correct any exaggerated claims regarding the project's success. Indeed, under the head "Who Rules in Schools?" Apple's Web site published this text from a 1996 speech by President Bill Clinton:

The facts speak for themselves. Children with access to computers learn faster and learn better. Scores on standardized tests for children with computers, according to [ACOT] . . . caused scores to go up by 10 to 15 per cent. Children mastered basic skills in 30 per cent less time. (Apple Computer Inc., 1996)

It is not surprising that my 1998 critique of ACOT did nothing to deter reference to this "research" as definitive proof of the link between technology and high achievement. Repeated

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frequently enough by enough sources, yesterday's propaganda becomes today's common knowledge. By 1998, most Canadians had already adopted enough technopositivism to reassure the most pessimistic marketer that the selling job was very nearly complete: Almost 60% of the public viewed the presence of "a computer in the classroom" as a very important factor influencing individual student success, whereas only 27% thought that a student's socioeconomic status was equally significant (Vector Research & Development, 1998).

I had no reason to expect that my 2003 column on ACOT's recycled promises would resonate with many teachers either. In my experience, relatively few teachers challenge the assumptions that credit information technology with generating a cornucopia of beneficial classroom outcomes. Even if their own experiences with technology in the classroom have been frustrating, disappointing, or disastrous, teachers tend to employ a Pogo-esque analysis: Their own inadequacy, lack of proficiency, or even incipient Luddism is the problem (Goodson & Mangan, 1996). They are inclined to believe that sometime, somewhere, teachers and students are reaping the anytime, anywhere bounty, even if it is not happening in their classrooms.

So I was surprised to receive this e-mail shortly after "Recycled Promises" (Robertson, 2003) was printed. In part, it read:

Your "Recycled Promises" article really got me going, for I've been leery of the "techno-positivists" for some time. However, apart from Neil Postman's books and a few pieces in *Harper's* over the years, I haven't seen much techno-skepticism, at least in the ed journals I read and the meetings I attend. It has seemed to me that much of the educational technology literature is grounded more in hope and faith than documented, readily replicable, successful, student-achievement-raising positive and economical practice. (Does that cover it?)

I've been looking for discussion of what most of my colleagues seem to consider settled issues. As a relatively new principal (3rd year), I haven't raised the issue in this way in my district—or school. Until your article, I was feeling rather alone, shall we say.

I'll try to follow up on the references in your article, but if you have other resources to direct me to, or additional comments, I would be grateful.

Sincerely, "P.T."<sup>1</sup>

## TEACHERS AND TECHNOLOGY

What explains P.T.'s inability to locate analyses that resonate with his sense that there are underlying, unspoken problems associated with our expensive enthusiasm for technology in the classroom? Armstrong and Casement (1998) introduced their excellent book on children, computers, and education by observing that most of the critical questions that should precede a headlong rush into technoenthusiasm not only have not been answered but also have not even been asked. This "presence of absence"—the palpable lack of engaged, informed, and critical debate—is particularly troubling and ironic because the adoption of technology is seen as the sole redemptive project that public education must seize or be declared institutionally redundant. This silence in what ought to be the discursive center should be deafening (Couture, 1997).

Analyses of technology's shortcomings, such as Cuban's (2001) assertion that "there have been no advances (measured by higher academic achievement) . . . over the last decade that can be confidently attributed to broader access to computers" (p. 178), have had no discernable impact on practitioners—or on policy makers for that matter. *ImpaCT2* (Becta ICT Research, 2003), the report of a 4-year, government-funded study described as "one of the most comprehensive investigations into the impact of [information technology] on education so far conducted in the [United Kingdom]" concluded that "infusing" schools with technology had failed to improve student achievement (Fielding, 2003). Education Secretary Charles Clarke responded by promising to push ahead with £920 million in new funding "to imbed the central role of [information technology] in raising standards . . . Some people have contested the value of ICT in teaching and learning. I challenge that view" (Fielding, 2003).

Little wonder teachers ignore critical expert analyses that are dismissed routinely by those further up the educational food chain and may seek to align themselves with the pervasively protech views of the educational hierarchy. At the same time, no profession is as overtly bullied into adopting technopositivism and its

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products. The text of this bullying is usually confined to the virtues of ICT, but the subtext is that depriving children of maximum access to it is tantamount to child abuse or at least education abuse. Truly improbable connections are presented as plausible, and few are prepared to point out the emperor's choice of attire. Apple "distinguished scientist" David Dwyer (1996) is representative of the magical thinkers whose views are rarely challenged:

Half of America's children engage in behaviours that place them in serious risk of alienation, even of death. [These children believe] that they are not wanted and are of little value in this society. Technology is the only vehicle we may ride as we work to engage more children in the excitement and life-enhancing experience of learning. (p. 31)

Armstrong and Casement (1998) observed that viewed from the outside, it seems that the public believes that "it's almost as if nothing worthwhile goes on in schools unless computers are involved" (p. 2). Increasingly, as public education is threatened on several fronts, treating the public as the customer who is always right has become synonymous with educational leadership. And it is rarely good business to argue with the customer.

Bryson and de Castell (1998) described teachers' professional discourse as full of "ventriloquat[ed] neophilic sentiments" that originate in the "official pro-technology discourse of the ministry, the district and the administration." This image of teachers as puppets is disturbing, but it is not an unfamiliar metaphor to describe how people respond to what they perceive as their own powerlessness or irrelevancy when faced with coercive power in charge of implementing change. Under such conditions, it may be acceptable to dispute approaches to implementation—the strategy—but it can be seen as treasonous to challenge the goal itself. Bryson and de Castell (1998) pointed out that disagreement can be professionally damaging:

Teachers who are perceived as hesitant, or who experience difficulties with the implementation . . . will be understood as "resisting" educational innovation; they may be characterized, for instance, as "reluctant users," or as "Luddites," in need of some kind of intervention facilitative of an "attitude change" with respect to new technologies. . . . From

this standpoint, refusal to implement new technologies in education is a negative action indicating a refusal to "grow and learn," that is to say, a falling away from the educational ideal of "The School" as a learning culture.

For some teachers, these risks are hardly abstract. On many occasions, teachers have approached me to tell their own stories after I have raised some of these issues in speeches. A first-year kindergarten teacher told me that her principal noted on her evaluation that on two occasions, she had walked past the classroom and noted that at least one computer was empty and that he found this very "troubling." Another told me of how her principal had instructed her to write a letter of apology to members of the parents' council because she had suggested that instead of buying more computers with the funds volunteers had raised, parents might consider buying books and musical instruments. The principal admonished her that she had compromised the image of the school as living "on the cutting-edge" of educational innovation. Female teachers, in particular, feel pressure to demonstrate high levels of competency and confidence in technology, especially if they have administrative ambitions. Just as it is assumed that tasks (or careers) that employ technology are more substantive than those that do not, it is implicitly assumed that technopositivists are more likely to be made of "the right stuff" than technoskeptics (Bryson & de Castell, 1998).

But challenging technopositivism risks compromising not only the credibility of individual teachers but also the validity of schooling itself. The claim that schools are chronically change resistant (and thus of questionable value within a change-as-progress paradigm) surfaces all too easily. Seymore Papert compared the school's response to the computer to that of a living organism that, defending itself against a foreign body, digests and assimilates the intruder (Conlon, 2002).

Papert probably overestimated the organized resistance to "embracing" ICT in schools. Most teachers are far too busy to plot a counter coup. Their chronic sense of insufficiency in the face of insurmountable challenges and inadequate support translate frequently into a sense of

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guilt and frustration rather than opposition (Couture, 1997). The nondiscourse makes it difficult for potential allies to discover each other in the staff rooms no one has time to visit any more. In the lived world of teachers, both exhaustion and technopositivism limit the framing of problems associated with ICT to matters of "insufficiency": not enough machines, memory, speed, bandwidth, technical support, or software; not enough know-how and sophistication among teachers; and of course, not enough time.

"Solutions" to these problems of insufficiency are believed to be imbedded within the technologies themselves. At a recent teachers' convention social, I asked a young woman what grade she taught. She replied, just a bit smugly, that she was not a teacher, she was Microsoft's representative in charge of "solutions." When I asked what problems her solutions resolved, she looked at me in utter confusion. The problems were irrelevant and apparently indistinguishable. Roszak (1994) quoted Joseph Weizenbaum of MIT describing the computer as "a solution in search of problems." "As things now stand," wrote Roszak, "there is an atmosphere of urgent concern . . . about *somehow* putting this magnificent solution to work in the schools—if only the right problem could be identified" (p. 51).

A few teachers, such as P.T., may harbor suspicions that this closed loop is tightening like a noose. But most of his colleagues are probably just as susceptible to the insufficiency-solutions analyses as technomERCHANTS hoped.

## TECHNOPOSITIVISM AS IDEOLOGY

If the expansion of ICT in the classroom enjoys government largess and propaganda, if its benefits are assumed even if they are unproven (or disproven), and if those who dissent from technopositivism are punished or believe they will be, we are no longer dealing merely in the realm of skill development, equipment management, or best practice. Technopositivism exhibits all the characteristics of an ideology.

Rosenblum and Travis (2002) defined ideology as "a widely-shared belief that has been constructed and disseminated by the powerful [that] primarily reflects their experience and functions for their benefit" (p. 279). For Gramsci (1971), ideological hegemony consists of two central components: the consent given by the masses and the apparatus of state (or state-endorsed) coercive power, which enforces discipline on those who withhold consent. Public education reinforces students' expectations of these rewards and sanctions and by legitimating the existing power relations imbedded within ideologies, perpetuates them (Apple, 2000).

Roszak (1996) likened the ideology of technopositivism to "compulsory enthusiasm for technology." Yet, some of this enthusiasm is genuine and consensual: Technopositivism taps into the human psyche, into our optimism and our desire to find external, mechanical solutions to complex, very human problems. The virtues of every emerging technology have been overestimated not only by those who stand to gain financially from their adoption but also by those who acquire or wish to acquire them. The car would end pollution because horses would no longer befoul the streets, "labor-saving" devices would end the drudgery of housework for those in heels and pearls, and nuclear weapons capabilities would put an end to war (Moll & Robertson, 1997). Those who stand to gain economic, social, or political power as general consent for this ideology find the public disposition very receptive to such promises and quite willing to ignore the trade-offs every technology demands.

Information technology promises to deliver more (and more important) learning for every student accomplished in less time; to ensure "individualization" no matter how large and diverse the class; to obliterate the differences and disadvantages associated with race, gender, and class; to vary and yet standardize the curriculum; to remove subjectivity from student evaluation; to make reporting and record keeping a snap; to draw out reluctant and disinterested parents; to keep discipline problems to a mini-

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mum; to enhance professional learning and discourse; and to transform the discredited teacher-centered classroom into that paean of pedagogy: the constructivist, student-centered classroom.

Bundled together and phrased so bluntly, these promises sound so overreaching that it would be easy to dismiss the judgment of the teacher (or administrator) who believed them. Yet, the promises and the ideology are interchangeable, communicated repeatedly to teachers by technomarketers, politicians, and even academics whose enthusiasms are usually more restrained until technopositivism becomes the ideological wallpaper of the classroom. That the promises are rarely spoken aloud by practitioners may well reinforce their influence. As Eisner (1994) pointed out, recognizing and identifying ideologies is made more difficult because they become "incorporat[ed] into our language conceptions that so shape our view of curriculum, or the aims of schooling, or human aptitude that we do not notice them as having this effect" (p. 49). The deeper the ideological attachment, the less likely it is that its presence will be suspected or its impacts considered. As Eisner observed, "When one ideology becomes ubiquitous it renders those acculturated insensitive to the ways in which their own beliefs have been shaped" (p. 49).

## AN INTEGRATED SOLUTION

*Time* magazine selected the personal computer as its "Man of the Year" just weeks after *A Nation at Risk* (National Commission on Excellence in Education, 1983) set the stage for two decades of mostly destructive "reform" of public education. The report—which Gerald Bracey (2003) described as a "veritable treasury of slanted, spun and distorted statistics" (p. 617)—laid the groundwork for "repurposing" schools so that they would more closely resemble—and more directly serve—the interests of business in a more competitive, globalized economy (Barlow & Robertson, 1994; Bracey, 2003). The National Commission on Excellence in Education (1983) called for every student to acquire

computer literacy and insisted that unless computer programming became one of the new "basics," the Asian Tigers would consolidate and exploit their (temporary) economic advantage. Education reform surged to the top of political agendas on both sides of the border both as a component of and an excuse for the neoliberal reforms that are required by corporate globalization.

Only technology could save schools; without its adoption, schools would never make the ubiquitous paradigm shift to the information age. Some teachers could easily be lured by promises that ICT would achieve miraculous results; the dubious could be ignored as dinosaurs or simply soothed like children. The Council of Ministers of Education, Canada (1997), told participants attending a Commonwealth education conference that unfortunately,

many teachers do not embrace the new technologies. . . . The fact that there is an aging teacher cohort exacerbates the problem. . . . Ways must be found to ease their anxieties, assuring them that the role of the teacher is still an important one. (Council of Ministers of Education, Canada, 1997, p. 14).

In 1999, the Council of Ministers of Education, Canada, was urging provincial education officials to "develop [teachers'] comfort through training," a slightly more sophisticated version of the "attitudinal conditioning" of both teachers and students that Ontario's Ministry of Education had advocated in 1984 (Goodson & Mangan, 1996).

These dates are important because until the mid-1990s, "the ideological leavening of the education market had not yet set. . . . The rhetoric of the information age had not yet fully conditioned the schools to welcome the gadgetry into classrooms" (Noble, 1996, p. 19). Under other circumstances, the leavening might have taken much longer. But as the neoliberal-neoconservative alliance consolidated its power and began to target education, the opinions of teachers (and academia) were marginalized. The corporate boardroom replaced the staff room as the site of educational decision making. As the economy faltered—or,

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to be more exact, as wealth was “redistributed” to the already wealthy—an anxious (nonwealthy) public began to lose confidence in the old-economy schools that were said to be impeding productivity. Schools had to be retrofitted, and luckily, the solution was at hand.

In 1995, the Ontario Royal Commission on Learning brought down a report praised equally by the political left and the right, especially for its emphasis on technology: “Technology stands out in our classrooms as a symbol to teachers, parents and students that schooling can and will change, that classrooms may have some bearing on the 21st century after all” (Ontario Royal Commission on Learning, 1995, p. 4). Remarkably, this sentence was lifted directly from an ACOT article written by the “distinguished Apple scientist” Dwyer. No public outcry greeted the inherent silliness of this statement or criticized its source deep inside the vested interests of the technology industry. After all, these were the folks who could spin straw into gold.

By the end of the 1990s, use of the most blatant technopropaganda had declined, its chief sources apparently confident that their messages had been received and acted upon. Despite cuts to public education budgets, “investments” in technology continued unopposed except by those who were insistent that more money could be found. Although tellingly, there is no aggregated account of what has already been spent on ICT in schools, (Froese-Germain, 2003), Dede (2000) reports that estimates from the mid-1990s put the cost of providing an online, multimedia computer for each two or three U.S. students to be approximately \$126 billion once ongoing costs were factored in. This level of commitment “would drain schools of all discretionary funding for at least a decade” (Dede, 2000, p. 185).

Yet, during this decade, there was little public discussion of technology-related costs, perhaps because behind the scenes it was assumed that eventually technology in the schools would accomplish what technology has always promised: to replace labor and therefore reduce costs. Lewis Perelman (1992) from the Hudson Insti-

tute was bullish: “Information technology is at least as capable of displacing and transforming labour requirements in education as in any other business. . . . This is the greatest opportunity since Rockefeller struck oil” (as cited in Robertson, 1998, p. 122). Once the public’s concern for their (own) kids merged with technoinfatuation and the marketization of schools, the high-tech sector found a welcome entrée into classrooms in exchange for its promise to offset technology costs. There, business has found not only a robust market for its products but also a source of pretrained workers “comfortable” with technology.

Downloading the cost of workforce development from the employer to the public is part of the business plan, as are increasing sales. There is considerable evidence that high-tech’s involvement with schools has little to do with “good corporate citizenship”: As Intel’s Pat Foy boasted, “What we do isn’t really philanthropy, which is giving something away. This is about making an investment. . . . If we don’t make those kind of investments, we’re going to go out of business” (Southwick, 1997, p. A13). *Business Week* reported that technocorps, including Microsoft and Toshiba, were stoking the education market: “Penetration of PC’s in American homes is stalled at about 40% . . . Where do you get new users? Enter the education market” (Gross, 1997). Selling to schools has a multiplier effect because parents have an incentive to purchase compatible equipment and software for the home—especially as projects designed to foster home-school communication by e-mail proliferate. It is also a way to get to the customer early: “This [education] market is most influential in educating neophytes in the benefits of high tech. And students, once converted, will remain active buyers of computer gadgetry for life” (Tausz, 1996, p. C6).

Most teachers (and parents) remain quite oblivious to these objectives, and many are quick to assume that corporations are motivated by the same desires they are. Such confusion about the differences between public and private purposes is both an artifact and an objective of neoliberalism. In 2001, a proud elemen-

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tary school principal in rural Manitoba told me all about his school's video-conferencing and fiber-optics capabilities (Robertson, 2001). "IBM's even training our teachers for us," he boasted. When I asked him what his teachers were being "trained" to do, he said they were learning to use computers for the remediation of students in Grades 1 and 2: "We can't afford specialists or teachers' aides." When I suggested that IBM might have some vested interest in remediating via computers rather than people, he disagreed vehemently. "I don't think of IBM as a corporation," he said. "They have no agenda. Neither do we" (Robertson, 2001, p. 14).

Neither do we?

### RETROFITTING SCHOOLS

Teachers trained during the "leavening" period—on both sides of the Canada-U.S. border—are now coming into their own. Many of P.T.'s colleagues were undoubtedly prepared in a haze of technopositivism that necessarily influenced their conceptions of curriculum, instruction, the teacher's role, and the purposes of schools. In all likelihood, the first three topics were addressed directly and the last not at all, although the transformation of the purposes of education is implicit, if not explicit, in educational technopositivism. Deference to the computer requires deference to what the computer does well, even if it necessitates revising notions of what school is all about. ICT excels in obtaining, organizing, and decorating information; a technocentric education necessarily privileges activities associated with information and devalues or squeezes out those activities less suited to information's multimedia display. Despite the rhetoric of interactivity and connectivity, using a "personal" computer, complete with "personal" productivity software, that takes you (singular) "wherever you want to go today" is an individualistic, isolated activity, one that is bound to change the ideas of collectivity and shared benefit that are imbedded in both traditional and progressive conceptions of schooling. Technopositivism requires that we see these changes as positive or at least inevita-

ble; we must become convinced that ICT's limitations are virtues and that the changes we must make to accommodate technology were what we wanted all along.

The strengths of ICT also skew the balance among the economic, personal, and societal goals of education in precisely the ways corporate North America has been demanding. The early adopters of ICT were employers who were wooed by promises of soaring productivity, paperless offices, and fewer employees on the payroll. ICT was mostly about the world of work; if technology was to thrive in schools, they too had to become mostly about work. But convincing schools (and everyone associated with them) to do whatever it took to join the wired world would succeed only if education was "retasked" as a scaffold for employment. And if work was increasingly technocentric, technomonitored, and techno-Taylorized, then schools would have to follow.

This recalibration of the personal, social, and economic functions of school is now nearly complete and has attracted little public debate. The premise that childhood is just preadulthood and that every grade is merely preparation for the next grade fit well with the idea that school is primarily the acquisition of skills in preparation for work. This assumption underlies most education-and-ICT pronouncements, whether issued by Microsoft, the World Bank, superintendents of education, or at the supermarket. Parents who put their toddlers into day cares that promise to make the diaper set computer literate expect schools to give their kids the inside lane on the technotrack to the jobs of the future. The promise of the premise resonates most strongly among those most disenfranchised by the fallout from corporate globalization, whose proponents insist that what is good for global capitalism is good for local citizens. If early exposure to spreadsheets will ensure that our children and students land on the right side of the good jobs-bad jobs dichotomy, then bring them on.

The claim that the so-called knowledge economy has an unlimited appetite for technologically savvy young workers persists de-



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spite projections that the demand for truck drivers, skilled trades, and low-end service sector workers will grow much more rapidly than that for high-end knowledge workers (Jackson & Robinson, 2000). This is not an accident. The economic and political purposes served by this distortion are many and extend well beyond selling more ICT to schools. Although Canada recently ranked first among 59 countries in its per capita availability of knowledge workers (Porter & Sachs, 2000), high unemployment, sagging productivity, and increasing child poverty rates have persisted. Deflecting responsibility for these problems has considerable appeal to both governments and employers. If they can be attributed to an insufficiency of workers with the right skills, these problems can be downloaded to the institutions responsible for "training" the workforce, especially to public schools.

If public education cannot fix these problems—and indeed, it cannot—those whose interests coincide with bringing "the discipline of the market" to schools or privatizing the system have yet another argument at their disposal. This merger between information technologies and corporatism has been intentional and mutually reinforcing, but it is not inevitable. Without question, "redemptive" technologies, as Franklin (1990) called them, exist and could be welcomed and developed in schools, but not if "we have no agenda." When the agenda of public education is lost or fogged in by technopositivism or forced out of the debate, corporatism will quickly fill the void.

In Canada, the directors of a federal program called SchoolNet, established in 1995 to bring technology to every classroom, were persuaded by key educators to advance (at least on paper) a somewhat "redemptive" vision of technology in the classroom. SchoolNet's first mission statement called for the "wise and discerning use of technologies to enhance learning, in conjunction with teachers and institutions, and within a rich array of teaching/learning experiences" (SchoolNet, 1996). SchoolNet's original governance structure included the education community and public interest groups as well as government officials and a few business lead-

ers. By 1998, SchoolNet had become so successful that the "community" was no longer required. Now sponsored by technology corporations and federal funding (estimated at \$100 million in 2003), SchoolNet has dropped all references to the "wise and discerning" use of technology from its mandate. SchoolNet now bluntly describes its mission as the promotion of ICT in schools "to develop a workforce which is able to compete in the knowledge-based economy" (SchoolNet, 2002).

### SELLING CONSENT.COM

Good marketers are shape shifters, quick to identify emerging trends that can be captured and exploited and just as quick to abandon those that become stale or factually unsustainable. The marketing of an ideology becomes part of the ideology; promise and propaganda merge. Ideomarketing identifies trends, but it also redirects them. Political, social, and educational trends can be gradually shaped by redefining both problems and solutions in ways that promote the ideology's utility. Technopositivism means that problems having little or nothing to do with technology must be "re-understood" until they match the solutions technology can offer. Problems that have a great deal to do with technology must be reformulated and directed elsewhere or else ignored.<sup>2</sup> Thus, even subtle strategic shifts among technomarketers can be significant because the marketing process distorts both problems and solutions for its own purposes, keeping the "product" of technopositivism ever fresh.

When Papert began promoting Logo programming language in 1967, he promised that teaching students to move those little turtles around the screen would promote "thinking skills," the education buzzword of the time (Robertson, 1998). Papert was so enthusiastic about technology in schools that he was quite sure it would eliminate them:

There won't be schools in the future. . . . I think the computer will blow up the school. . . . The whole system is incompatible with the presence of the computer. . . . But this will happen only in communities of children who have access to computers on a sufficient scale. (as cited in Cuban, 1986, p. 72)

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Few teachers knew that they were being sold the discarded derivatives of rudimentary military software designed to replicate tactical maneuvering (Noble, 1991). When young logoists failed to demonstrate superior reasoning skills, the task-changing sales pitch shifted. Computer use would enhance student achievement—and among others, Apple Computer Inc. (and well-placed friends) undertook to prove that it was so. As the drums began to beat for higher standards, technology purchases soared. Faced with a serious glitch in this marketing plan—namely, lack of evidence linking the use of technology, especially affordable technology, to improved student achievement—technomarketers again shifted gears. ICT would be repositioned as the friend of equity, even if the concept had to be redefined in the process.

Teachers, after all, were notoriously preoccupied with educational and social equity, and even the public was becoming restive about the “savage inequalities” (Kozol, 1991) found at school. Besides, ICT sales could not reach their full potential until the “disadvantaged” (or at least their sympathizers) became just as convinced of technology’s beneficence as were the affluent. Suddenly, the technomERCHANTS became the poor child’s best friend, confident that few critics would draw attention to the industry’s persistent and successful lobby for public policies, especially reduced taxation, that have exacerbated the gap between the rich and the poor and have savaged public education (Robertson, 2002).

Microsoft (1997) commended the U.S. Department of Education for approving the use of Title 1 funds for the purchase of laptop computers and named Harlem as a community that would benefit from the reallocation of school budgets in favor of technology purchases. Equal access became technology’s newest promise, but the term no longer referred to food, shelter, or justice—just access to technology. Kids were no longer poor, they were information poor.

Shortly after the American Association of University Women (1992) reported that girls were being “shortchanged” by schools, technology’s menu of marketable solutions was

expanded to include gender equity. A 1993 advertisement from Apple featured a teenaged girl claiming “Everyone is created equal . . . and then somebody gets a McIntosh” (Robertson, 1998, p. 190). As the poster equity issue of its day, the situation of teenaged girls had begun to generate a range of school-based interventions, but the forces of conservatism ensured that anything that smacked of the liberalism of affirmative action or special treatment would be short-lived. Racial and gender equity would be tolerated as desirable goals, but (according to those who benefited the most from inequity) solutions would never be found in responding to difference, especially through regulation or government-initiated, publicly funded programs. The solutions would be found in individual rather than collective progress by rewarding “merit”—and through technology.

Technomarketers were quick to promote and capitalize on this reformulation of the solution. Unlike teachers, whose implicit biases were assumed to be the underlying problem, computers were marketed as color blind and gender blind. Surely such blindness could be promoted as the distinctive feature of a level educational playing field. Instead of understanding, recognizing, and responding to differences influenced by gender and culture, approaches that equity advocates had been encouraging teachers to adopt for decades, teachers had to be persuaded that real equity could be achieved only by ignoring difference.

When the promises of technology fail to deliver and the public gets impatient for e-rewards that never seem to quite materialize, the marketing moves on. As the dot-com’s topple, fewer ICT “experts” are prepared to be sandbagged by perfectly reasonable questions about the state of the cost-benefit equation. This explains, in part, why technology’s new spokespersons are kids: Only a boor would expect a child to be able to back up his or her enthusiasms with some facts. A recent edition of SchoolNet’s magazine for teachers features, alongside many ads, an interview with technopositivist Papert. But it gives top billing to an article that describes students as the real

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experts on e-learning (Rumpf, 2002). Out with the gurus, the dot-com moguls, the stuffy academics, and the teachers too. Students rule.

**E-learning according to the experts:  
What students are saying begins:**

E-learning is rapidly becoming the buzzword of 21st century education. It is essentially what occurs when education and training are delivered and supported by networks . . . Therefore, computers and the Internet are opening doors and expanding minds everywhere. (Rumpf, 2002)

Out of the mouths of babes—the article goes on to quote three students’ “spontaneous” (but strangely articulate) comments on e-learning. Each manages to squeeze in the name of at least one branded technology product that schools should acquire and praise for some advertising-laden “educational” sites. The SchoolNet Youth Advisory Board (2002) recommended (to the sponsors’ delight, one might assume) that more broadband access be acquired and that teachers make more use of chatrooms and video conferencing. No doubt the recommendation to develop more partnerships with the private sector sprang unbidden from the lips of one of the SchoolNet Youth Advisory Board’s 13-year-old experts.

By hiding its agenda behind student voices, SchoolNet is adopting an emerging strategy finding favor among savvy marketers eager to sell everything from fast food to political candidates (Klein, 2000). Marketers are targeting youth not only as a lucrative market segment but also for their influence on peers, parents, and the institutions that serve them. It is all about coolness: thinking like the cool kids, whatever your age, listening to them, and catering to their mercurial interests. Corporate survival depends on co-branding particular products with coolness. Of course, nothing is cooler among youth than technology, especially the kind that promises to merge digital and emotional connectivity.

On one level, it is business as usual. Marketers have routinely exploited consumers’ emotional insecurity (or vanity) and sold status to spur consumption. But on another level, in an uber-consumerist society, deferring to youth in matters of consumerism means deferring to

them period. As students become customers and teachers merely service providers, another adage takes hold: The customer is always right. We have not begun to consider the cascading effects of transforming youth into the role of elders/rulers, wise and powerful ones whose judgment should be sought and heeded.<sup>3</sup>

Thus, the marketing of technopositivism appropriates and reworks education’s purposes and problems and redefines the roles of students and teachers until they are all more amenable to ICT’s limited range of capabilities. It is virtually certain that P.T. and his colleagues have been exposed to all these attempts to match the tools of technology to the tasks of education. It is highly unlikely that they have had the opportunity or encouragement to consider how the tasks and the tool users have been altered to suit ICT or how these alterations are imbedded in technopositivism and its marketing. These same teachers are very likely unprepared to challenge the next marketing wave: ICT is being rebranded as the key to constructivism. Just as the tool changed the task when technology set its sights on learning as information and equity as sameness, technopositivism is about to repurpose constructivism.

## CO-OPTING CONSTRUCTIVISM

I set out to discover what P.T. might encounter if he signed up for a teacher education course that dealt with ICT and constructivism. In what readers will recognize as a significant irony, I could not devise a research method better suited to this task than “googling.” A Google search using *technology* and *constructivism* as the search terms generated 33,100 matches. The first few links took me to a number of scholarly articles, most of which were preoccupied with degrees of radicalism imbedded in competing definitions of constructivism and their subsequent analysis. Many more than half of the links I tried were dead. Despite my search terms, few articles of the scholarly genre dealt with technology except in passing, that is, as part of the landscape of “change” that made school transformation urgent and so forth. Other articles were written manifesto style, urging readers to repudiate statist education in favor of free-market

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constructivism. Neither type of article seemed likely to make it onto P.T.'s hypothetical reading list. With a mere 33,000 more matches to explore, I moved on fairly quickly. From the ".edu" uniform resource locators, I clicked randomly on likely sounding titles, hoping that this strategy might approximate scientific sampling of what teacher educators, or teachers themselves, had to say.

*Technology in a Constructivist Classroom*, by Donna Ferguson Pabst (2002), looked promising. Her bio identifies her as a teacher educator at the University of Northern Colorado and a program manager of its Infusing Technology Use in the Preparation of Colorado Preservice Teachers Project. In her words,

The process of teaching has not changed substantially over the past 100 years. . . . The technological changes that have swept through society have left the educational system virtually unchanged. It is frightening to note that as our children are growing up, they may not be receiving the instruction and knowledge necessary to function in a technological world. The task of the educational system should be to embrace the future and empower children to learn with the tools available to them. . . . If we assign technology to a secondary role, which does not fully utilize its potential strengths, we are failing to use it to its fullest potential. . . . Current interactive multimedia technologies have the potential to represent ideas in almost any form so students view the resources, creating their own meanings and understanding of the information they encounter.<sup>4</sup>

The very familiarity of these statements along with their utter lack of tentativeness (or footnotes) alarm me less than their interchangeability (and interoperability) with a Microsoft press release. In my mind, each statement raises some important questions.

*The process of teaching has not changed substantially over the past 100 years.* Is it true that teaching has not changed in 100 years? If so, could this be because human interaction is the essence of education and carries no best-before date? If it is not true that the classrooms of 1902 and 2002 are interchangeable, why is this statement repeated so often and what exhortation usually follows such an untestable assertion? Who usually makes this claim, and for what purpose?

*Schools have always mirrored the values of our society; however, the technological changes that have swept through society have left the educational system virtually unchanged.* Is it not time to contest the old saw about schools mirroring the values of society? After all, schools are at the forefront of teaching environmental responsibility and nonviolent conflict resolution. If schools truly mirrored society, would society not have to look a lot better than it does?

How did technological change become one of the "values" of society? Is this not a paradoxical position, because technopositivism insists that because technology is "only a tool," it is value free, neutral, and entirely under the moral control of tool users?

Does Pabst (2002) really mean that schools have been unchanged by technology or does she mean that they have not changed enough? What would enough look like?

Are all the changes that have "swept through society" good ones that schools should emulate? What would schools have to give up to incorporate all these changes? What might all those 1980s students who were taught to program in Basic have learned instead that might not be so laughingly outdated today? What has and will it cost (in human and financial terms) to make these trade-offs?<sup>5</sup> What does it cost to make these trade-offs unconsciously? Is change always a virtue, even if one is "facilitating change" toward something worse?

*It is frightening to note that as our children are growing up, they may not be receiving the instruction and knowledge necessary to function in a technological world.* I too harbor fears about what students are learning, or not learning, about the world around them, but I see little reason to worry that failure to master the latest incarnation of various electronic productivity tools poses a serious threat to their ability to function "in a technological world." I assume that most of those interested in this article have more than sufficient technical skills to produce it themselves, and none of us took keyboarding in kindergarten. I cannot conceive of a single software application that could be mastered today by 15-year-olds that would be of value 10 years from

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now, although I can think of other skills and knowledge that will endure. Technopositivists believe that there is no need to choose. Realists recognize the trade-offs.

I am also not sure what “a technological world” looks like. Most people in this technological world have never used a flush toilet. Many drink water dirtier than that which would be flushed down the toilet, if they had one. The technological world is the privileged world that fiercely guards its social, economic, and political borders in the interests of those who use technological supremacy as a very big stick.

*The task of the educational system should be to embrace the future and empower children to learn with the tools available to them.* This call to “embrace the future” reminds me of a remark made by Postman (1995): When you are embracing somebody (or something), you are too close to get a very objective look at him, her, or it. Postman also reminded us that schools create the future: Unless one’s operating philosophy is predestination, there is no singular future but a multiplicity of possibilities for individuals and multiple futures for the planet. The language of the “known future” is characteristic of technopositivism and serves its sister ideology of corporate globalization. Surely setting out education’s highest purpose as getting students to passively adapt to a predetermined future is a poor substitute for persuading students that they can contribute to the creation of better futures.

*If we assign technology to a secondary role, which does not fully utilize its potential strengths, we are failing to use it to its fullest potential.* Technology is a jealous god prepared to work its magic only if it is ceded the “primary” role—even in student-centered classrooms. Using only a little technology is as backward as not using it at all.

*Current interactive multimedia technologies have the potential to represent ideas in almost any form so students view the resources, creating their own meanings and understanding of the information they encounter.* Although I have read the final sentence in this excerpt several times, I remain confused. Is it students’ ideas that can be repre-

ented “in almost any form,” and once represented, technology will make it possible for students to understand their own ideas? Surely not; perhaps the author means that viewing someone else’s ideas (or resources) is a creative process that results in the formulation of any number of possible “meanings” derived from the information that has been “encountered.” Is this always a good thing? I have certainly encountered the information provided and I grant that I am creating many meanings, but none seems sure to have understood the author’s intent. Is it possible that some information, regardless of whether it is presented electronically, conveys no meaning of value?

Pabst’s (2002) views may not be representative of how teacher educators are depicting the relationship between technology and constructivism, but she is by no means an isolate. She is in familiar company in repeating the prevailing rationale for getting students ready for “the technological world” without challenge or complaint. In fact, her “analysis” is more or less indistinguishable from that offered by the authors (and endorsers) of the International Society for Technology in Education (ISTE, 2002) standards document, which specifies in amazing detail the knowledge, skills, and dispositions that various levels of teachers/technospecialists must acquire and demonstrate. The document’s preamble and rationale calls for all teachers to become capable technology users in order to “support the development of technology-capable P-12 students, who must, in today’s world, become . . . capable information technology users” (ISTE, 2002, p. 5). Apparently, this document was prepared on a computer not yet equipped to root out tautologies.

ISTE is proconstructivist, protechnicist, and proactively promoting their conceptual convergence. The ISTE (2002) standards report provides no evidentiary support for its claim that “observable characteristics of constructivist learning environments . . . can be facilitated by technology” (p. 5) beyond referring to a “diagram [that is] included in all ISTE documents.” According to this diagram (which bears a striking, if uncredited, resemblance to Ferguson and Naisbett’s [1980] summative chart in *The Acquarian Conspiracy*), traditional learning envi-

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ronments are teacher centered, passive, and devoted to factual, knowledge-based learning that relies on single-sense stimulation. By contrast, new (techno-enhanced, constructivist) classrooms are student-centered, active places where informed decision making has supplanted facts and knowledge through multisensory stimulation. The document does not expand on the link between sensory stimulation and better decision making.

According to ISTE (2002), "Although the strategies for the new learning environments described do not specifically denote use of technology, it is clear that technology can very dramatically support the implementation of these strategies" (p. 6). One might expect that anything so clear might be documented rather than merely asserted; the "presence of absence" of support for ISTE's central argument ought to alert and alarm—but it probably will not. In Eisner's (1994) words, "What is considered to be given or believed to be axiomatic in education enjoys a kind of security that is seldom threatened by marginalization" (p. 48)—or the obligation of justification.

## TOWARD A THEORY OF NEGATIVITY

Teachers such as P.T. are trying to find information, insight, and support when they face the trade-offs masquerading as opportunities, the solutions that require problems, and the ideology of technopositivism disguised as research on learning. This support will not come from ISTE, the technomercants, politicians of any popular persuasion, or the barons of globalization.

Outside teacher education classrooms, I see little possibility that P.T. will find a setting that raises the dark side of ICT, although throughout his career, he will continue to be bombarded by technopositivist pressures and propaganda. If teachers are to challenge the ideology of technopositivism, they must know it exists. If they are to make wise trade-offs, they must know what is on the table and why it is there. Only then can they make choices that put education first and technology second (or third or fourth).

Thus, teacher educators must adopt a stance toward ICT in the classroom that deliberately exposes its underbelly. I realize that this statement offends the doctrine of pursuing objectivity and balance to which many academics aspire. But balance can be attained only when the countervailing forces acting upon an object—in this case, the teaching profession—are roughly equivalent. A dose of techno-negativity, even if its roots are to be found in the discredited traditional world of fact-and-information-based learning, may be exactly what the profession needs if it is to reach equilibrium.

I believe that both aspiring and practicing members of the profession could benefit from reflecting on some deliberately critical questions. For starters,

1. Is becoming a "guide on the side" a promotion? (As a follow-up, has any real teacher ever described himself or herself as "a sage on the stage"?)  
If virtual means "almost," what does "virtual learning" mean?
2. Was Max Frisch (1957, as cited in Postman, 1995) right when he defined technology as "the knack of so arranging the world that we do not experience it"?
3. Why do teachers confiscate notes written by hand and passed under desks but encourage students to send the same notes electronically?
4. Was Roszak (1996) right when he said, "All freebies from the computer industry should be regarded as you would a free sample from your friendly neighborhood crack dealer" (p. 14)?
5. What did Franklin (1996) mean when she wrote, "The main thing you learn using technology is how to use technology" (p. 11)? Discuss using Washington2Washington (Microsoft, 2000) as a case study.
6. How much money has your school or district spent on ICT in the past decade, including the "training" of teachers and machine support? How much of the hardware and software that was purchased 5 years ago is still being used? Make the same calculation for books and their "support."
7. What would happen if a teacher applying for a job in your school said that if it were up to her or him, she or he would make very limited use of ICT in the classroom?

Such questions only begin to mine the possibilities of developing a theory of negativity, but they might foster among teachers a predisposition to ask the kind of questions about ICT that

cannot be answered by the platitudes of technopositivism. Through negativity comes balance, and that is a start.

## NOTES

1. A few cynical readers may wonder if such a letter, so perfect for my purposes in writing this article, could really have appeared in my inbox so serendipitously. I can assure you that it did, and other than the kind words that preceded and followed the excerpt, I have copied it exactly, removing only the details that would identify my correspondent. This is what it has come to.

2. An outrageous but nonetheless true example of this redefinition process resulted in a public-private partnership that provided Toronto's homeless with e-mail accounts so that they could "surf the net" to find jobs and housing "for a small fee" (Canadian Press Newswire, 1998). Officials explained that connectivity brought the homeless into the community, which is much cheaper than building shelters and affordable housing—such "old-economy" solutions.

3. The entitlements of technophiles need not be left to inference when they can be taught directly. A particularly odious "project" called Washington2Washington, sponsored by Microsoft (2000) and blessed by education Secretary Richard Riley, invited networked junior high students to respond to the "U.S. President's" plea for advice on how to "colonize" a nearby, resource-rich island. By "executive order," the president has turned to "Generation I, the generation of Americans who have grown up with the Internet, to carry out his executive order." Armed with laptop computers, digital cameras, Microsoft software and connectivity, these students were to develop competing colonization strategies. The project's launch was covered extensively (including an article in *Time*) as an example of "collaborative" learning and partnership between the public and private sectors. The student-produced results, which are meager and (in my opinion) pretty pathetic, can be found at <http://www.microsoft.com/w2w>. Note how student "reflections" on what they learned deal almost exclusively with technology products.

4. I feel somewhat guilty to have randomly targeted Pabst's brief essay for such detailed criticism, especially after Google searching her name turned up a bio complete with wedding pictures and every suggestion that this educator is committed and sincere. My search for other papers of more substance that she may have authored was unsuccessful.

5. The principal of a small high school in northern Ontario made the news when he decided to put the school's prize possession—an Andy Warhol silkscreen—up for auction. "It sounds crass . . . but when I looked at that piece of art, I said to myself, that's the better part of a computer lab" (Carver, 1997, p. 6).

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*Heather-Jane Robertson is an independent education writer and consultant based in Ottawa, Canada, and vice president of the Canadian Centre for Policy Alternatives. She is the coauthor, with Maude Barlow, of Class Warfare: The Assault on Canada's Schools*

*(Key Porter, 1994) and the author of No More Teachers, No More Books (McClelland & Stewart, 1998). Her research interests include the privatization of education and the politics of education reform.*