

## THE CULTURE OF REFUSAL

Technology can potentially work change on both the organizational and practice patterns of schools. That change can subvert or reinforce existing lines of power and information, and this change can be, for the technologist or the school personnel, intentional, inadvertent or a combination of the two. Since schools are not monolithic but composed of groups with diverse and generally competing interests on the rational, organizational, and symbolic levels, adoption and implementation of a proposed technology are two very different matters.

And yet each battle is essentially the same battle. The technologists' rhetoric is remarkably consistent regardless of the specifics of the machine at issue. So too is their response when the technologies in question meet with only a lukewarm response: to blame the stubborn backwardness of teachers or the inflexibility and insularity of school culture. While elements of both of these certainly play their part in what I'll call 'technology refusal' on the part of schools, it behooves us to remember that all technologies have values and practices embedded within them. In this respect, at least, technology is never neutral; it always makes a difference. From this perspective, the reactionary response on the part of schools (by which I mean the response of individuals within schools acting to support their institutional function) perceived by technology advocates makes a great deal more sense than the pig-headed Luddism so often portrayed. Further, technology refusal represents an immediate and, I believe, fundamentally accurate assessment of the challenges to existing structures and authority that are embodied or embedded in the contested technology. I believe further that the depth of the resistance is generally and in broad strokes proportionate to the seriousness of the actual threat.

Change advocates, of whom technologists are a permanent subset, often try to have things both ways. On the one hand, the revolutionary potential of the innovation is emphasized, while at the same time current practitioners are reassured (implicitly or explicitly) that their roles, positions, and relationships will remain by and large as they were before. The introduction of computers, for example, is hailed in one discourse (directed towards the public and towards policy makers) as a process which will radically change the nature of what goes on in the classroom, give students entirely new sets of skills, and permanently shift the terrain of learning and schools. In other discourse (directed towards administrators and teachers) computers are sold as straightforward tools to assist them in carrying out preexisting tasks and fulfilling preexisting roles, not as Trojan Horses whose acceptance

will ultimately require the acquisition of an entirely new set of skills and world outlook. Since school workers and their practice do not (indeed, cannot, under the assumptions and constraints of school organization) fully maximize instructional delivery, the "remedies" or alternatives proposed by technologists necessarily embody overt or implicit critiques of workers' world view as well as their practices. The more innovative the approach the greater its critique, and hence its threat to existing principles and order. When confronted with this challenge, workers have two responses from which to choose. They can ignore or subvert implementation of the change or they can coopt or repurpose it to support their existing practices. In contrast to generalized reform efforts, which Sarason maintains are more likely to be implemented the more radical they are, these efforts by technologists to change the institution of schooling from the classroom up make teachers the objects rather than the subjects of the reformist gaze (Sarason, 1990). The more potent and pointed technologists' ill-concealed disinterest in or disregard for the school-order of things, the less likely their suggestion are to be put into practice. The stated anxiety of teachers worried about losing their jobs to machines is also a resistance to the re-visioning of the values and purposes of schooling itself, a struggle over the soul of school. It is about self-interest, to be sure, but it is also about self-definition.

Much of the question of teacher self-definition revolves around the anxiety generated by their unfamiliarity and incompetence with the new machines. The fear of being embarrassed is a major de-motivating factor in the acquisition of the skills required to use computer technology in the classroom (Honey & Moeller, 1990; Kerr, 1991; Sheingold & Hadley, 1990). This is an area where institutional and individual interests converge to produce a foregone effect. The (self-) selection for teaching of individuals who by and large show neither interest nor aptitude for ongoing intellectual development buttressed by the condition of lifetime employment almost guarantees a teacher corps that is extremely reluctant to attempt change. This, in turn, suits the interests of school management whose job is made considerably simpler with a population of workers whose complacency acts as a buffer against change. Since teachers' situationally-reinforced lack of motivation inhibits their action as change agents, school administrators are relieved of the responsibility for developing the creative management skills that would be required for teachers to develop new classroom skills.

There are technologies which are suited perfectly to such a climate; those that either actively support the organization of schools or are flexible enough to readily conform to it (Cohen, 1987). Not surprisingly, they are the ones that are so ubiquitous, so integrated into school practice as to be almost invisible. On the classroom level we would

expect to find tools and processes that both ease the physical labor of the teacher while maintaining her traditional role within the classroom. The blackboard, the duplicating machine, and the overhead projector come immediately to mind. All enhance the teacher's authoritative position as information source, and reduce the physical effort required to communicate written information so that more energy can be devoted to the non-didactic tasks of supervision, arbitration, and administration. This type of technology seldom poses a threat to any of the teacher's functions, is fundamentally supportive of the school-values mentioned earlier, and reproduces locally the same types of power and information relationships through which the teacher herself engages her administrators. We might also consider the school intercom system. Ideally suited to the purposes of centralized authority and the one-way flow of information, it is as ubiquitous in classrooms as its polar opposite, the direct-dial telephone, is rare. Technologies such as these will seldom meet with implementation resistance from teachers because they support them in the roles through which teachers define themselves, and contain no critique of teachers' practice, skills, or values. In general, resources that can be administered, that can be made subject to central control and organization, will find more favor from both administrators and teachers than those that cannot.

These examples of successful technologies confirm the requirement of simplicity if a technology is to become widely dispersed through classrooms. This has partly to do with the levels of general teacher aptitude described above, partly with the amount of time available to teachers to learn new tools, and partly with the very real need for teachers to appear competent before their students. As with prison administration and dog training, a constant concern in the running of schools is that the subject population not be reminded what little genuine authority supports the power its masters exercise. Although there are more complex models for understanding the diffuse polysemous generation of power and status that comprise the warp and woof of institutional fabric (see Foucault on medicine or prisons, for example), for our purposes a simple model of authority-as-imposition will suffice. In this tradition, French and Raven describe the five sources of power as follows:

1. Reward, the power to give or withhold something the other wants;
2. Coercive, the power to inflict some kind of punishment;
3. Legitimate, the use of institutionally-sanctioned position or authority;
4. Referent, the use of personal attraction, the desire to be like the

other, or to be identified with what the other is identified with;

5. Expert, the authority that derives from superior skill or competence.

(French & Raven, 1968).

Teachers are fully authorized to make use of each of these sources of power. Indeed, those teachers most respected by their peers and their students deploy some situationally optimal combination of these. For students, however, the only authorized form of power is Expert power, expertise the only legitimated field on which to contest adult authority within the school. Thus, an unfortunate (but hardly unforeseeable) consequence of school organization is that many teachers are threatened by students' acquisition or demonstration of mastery that is equal to or greater than the teacher's own within a shared domain. Although some teachers handle it with more grace than others, most dread the occasions when they are "shown up" by their students, and we have all witnessed or experienced those awkward, lingering out-of-time moments when the teacher must voluntarily cede authority to the student who knows how to thread the projector or connect the VCR. At such times the brittle consensual veneer of adult expertise is cracked, the order of things briefly disrupted (confirmed by the sudden eruption of murmuring in the classroom), and nervous, alert attention directed by teacher and students alike toward the performance of the evanescent student expert.

It is one thing for students to demonstrate expertise in areas that are not expected to be a formal part of teachers' skill set, like threading 16mm projectors. If technologists have their way, however, teachers will be expected to know how to use computers, networks, and databases with the same facility they now use blackboards and textbooks, and with greater facility than the roomful of resourceful, inquisitive students who were weaned on the stuff. The pressure towards competence and the acquisition of new skills, which is generally not a feature of school culture or the employment contracts under which teachers work, will be strong. It will come from unexpected directions: from below (from the "tools" themselves) and from within, as teachers struggle to retain mastery over their students. It's easy to see why teachers would resist this scenario. Administrators, for their part, have equally few

organizational incentives for inviting this disruption into schools. Not only would they be required to respond to teachers' demands for the time and resources needed to attain proficiency, they themselves would need to attain some minimum level of competence in order to retain authority over teachers. Since there is no way for the system to reward this kind of involved, responsible management, nor any way to penalize its absence, school authorities' most sensible route is to ignore or quell demands for the implementation of such potentially disruptive processes.

The machines of the day are microcomputers and microcomputer networks. Having inherited the mantle of modernity from instructional television and computer-aided instruction, they are presently charged with the transformation of schools. As school technologies, however, they are unusually polyvalent: they can both support and subvert the symbolic, organizational, and normative dimensions of school practice. They can weaken or strengthen the fields of power and information which emanate from the institutional positions of students, teachers, and administrators. It's my thesis that authority and status within organizations are constituted from two sources: power, itself sourced as outlined by French and Raven, and control over and access to the form and flow of information. Authority and status are singularities, as it were, produced by a particular confluence of (potentially) shifting fields of power and information. This is true in the organizational sense for all bureaucracies, where the person who knows something is as important as the person who can do something. In schools, though, facility with information is (in a slightly different sense) at the heart of key norms, values, and practices as well. As bureaucratic, hierarchical institutions and as concretizations of a particular tradition of pedagogy, schools teach and model as canonical a particular arrangement of paths for the flow of information. Introducing computers into schools highlights these assumptions, causes these normally invisible assumptions and channels to fluoresce.

It is not their capacity to process information that gives computers this special ability. Data processing systems have existed in large school districts for decades, helping central administration to run their organizations more efficiently. Irregularities of control call attention to themselves and thereby remind workers that such arrangements are created things, neither aboriginal nor ahistorical but purpose-built and recent. To the extent that automation can help existing administrative processes to run more smoothly and recede into the background, they help to reintroduce a kind of medieval reassurance regarding the rightness and permanence of a given order. Schools and school workers, particularly, seem to prefer this type of predictability. Such data processing regimes also relieve school workers of much of the tedium of their administrative work: scheduling, grading, communication, and tracking are all made less

drudgery by automation. The easing of these burdens offered by the machine fits very well with popular conceptions of these labor-saving devices and offers workers a benefit in exchange for their participation in a process which strengthens the mechanisms of control exerted by the bureaucracy over their daily lives and practice. To the extent that they are aware of this bargain at all most are willing to accept it.

This strengthening of administrative priority and control over teachers is recapitulated by teachers over students when computers are used for CAI or as "integrated learning systems." Although they have fallen out of favor somewhat of late, the vast majority of school-based computer use has taken place in this context. Kids are brought en masse to a (generally) windowless room presided over by a man with no other function than to administer the machines. There they work for between 30 and 50 minutes on drill-and-practice software that compels them to perform simple tasks over and over until they have reached a preset level of proficiency, at which time they are started on new tasks.

This behaviorist fantasy fits neatly into the organizational model of schools, and into much pedagogical practice as well. The progress and work habits of each student are carefully tracked by the server. Reports can be generated detailing the number of right and wrong answers, the amount of time spent on each question, the amount of "idle" time spent between questions, the number of times the student asked the system for help, the tools she used, etc. Not much use is ever made of this information (assuming some could be) except to compare students and classes against one another. Nevertheless, the ability to monitor work habits, to break tasks down into discrete chunks, and the inability of the student to determine what she works on or how she works on it fits quite well into the rationalist model of the school-as-factory and the technologists goal of maximizing "instructional delivery."

Such systems were an easy sell. They complemented existing organizational and practice models, and they signaled modernity and standardization (Newman, 1992). (Perversely, they were also claimed to promote individualization, since each student was tasked and speeded separately from the rest of the group. The fact she was working on exactly the same problems, with the same tools and in the same sequence as her classmates seems not to have mattered.) Since students work in isolation they accord well with the premise of structured competition. Since mastery at one level leads relentlessly to more difficult (but essentially identical) problems the students never have a chance to exhibit facility of a type that would threaten their teacher, and since the terminals at which they work are both limited in their capacities and centrally controlled students have no opportunity to acquire a disruptive mastery of the technology itself.

Labs like these are prime examples of the non-neutrality of technology. They do not foster all or even several types of learning but rather one particular, and particularly narrow, conception whose origin is not with teachers who work with children but with the technologists, industrialists, and military designers who develop "man-machine systems" (Noble, 1991). They do not encourage or even permit many types of classroom organization but only one. They instantiate and enforce only one model of organization, of pedagogy, of relationship between people and machines. They are biased, and their easy acceptance into schools is indicative of the extent to which that bias is shared by those who work there.

The technology I have been describing is not the technology of computers, or computers-in-schools *\_per se\_*, anymore than armored cars represent the technology of internal combustion or washing machines the technology of electromagnetic induction. They are machines, to be sure, but machines require a social organization to become technologies. Thus the uses of computers described above for data-processing and "learning labs" are not examples of computer technologies but of normative, administrative, and pedagogical technologies supported by computers.

This distinction is important because many teachers, lay people, and some administrators have concluded from their experiences with such systems that computers in school are anathema to their notions of what schools ought to do with and for children. Computer-based technologies of the kind described above are hardly "neutral." Indeed, they are intensely normative and send unambiguous signals about what school is for and what qualities teachers ought to emulate and model. Interpersonal and social dynamics, serendipity, cognitive apprenticeship, and play all seem to be disdained by this instantiation of machine learning. The teacher's fear of "being replaced by a computer" is a complex anxiety. It obviously has a large component of institutional self-interest, since no-one wants to lose their job. But the notion that it would be possible to be replaced by a machine cuts deeper, to the heart of teachers' identity and self-respect. There has evolved among teachers an insular culture of self-congratulation that attempts to reassure them that they are competent and selfless professionals, that their social and institutional function is to develop the very best qualities in the children they serve. The suggestion that the de-skilled tasks that teachers are called upon to perform might be better performed by machines calls this self-image into question in a manner that is painfully direct. It is hence unwelcome.

Beyond the question of self-respect but intertwined with it is the frustration that many teachers experience with the promulgation of a

purely rationalist notion of education. Teachers, after all, are witness and partner to human development in a richer and more complex sense than educational technologists will ever be. Schools are where children grow up. They spend more waking hours in school with their teachers than they do at home with their parents. The violence that technologists have done to our only public children's space by reducing it to an "instructional delivery vehicle" is enormous, and teachers know that. To abstract a narrow and impoverished concept of human sentience from the industrial laboratory and then inflict it on children for the sake of "efficiency" is a gratuitous, stunting stupidity and teachers know that, too. Many simply prefer not to collaborate with a process they experience as fundamentally disrespectful to kids and teachers alike.

Finally, there is the issue of the reshaping and redefining of teaching practice to suit the needs of technology. Cuban and Cohen maintain that technologies that are not sufficiently flexible to suit the existing strictures of classroom practice have little chance of significant implementation (Cohen, 1987; Cuban, 1986). While this may be true for "instructional delivery vehicles" like educational films or television, it doesn't hold for the myriad other educational technologies whose domain and deployment are not circumscribed by an individual classroom. The most obvious example is standardized testing. There is an extensive body of literature which shows that this technology, seldom supported and often resisted by teachers, has nevertheless had profound consequences on their classroom practice (Shepard & Dougherty, 1991; Shepard, 1991). Teachers have significantly reoriented the content and method of their instruction to facilitate capture by these instruments. Despite the absence of formal institutional sanctions, teachers have succumbed to strong pressure from their administrations for students to perform well on these tests, and have restructured their practice accordingly. The dictum that, "when the classroom door closes teachers can do what they like," doesn't apply when crucial technologies of assessment reside outside the classroom (See Note 4). Teachers are hence understandably concerned that the introduction of computers in the form of a technology with its own built-in assessment capabilities will not function to provide them with another tool they can use or not as they wish, but rather that it might force them to tailor the content and style of their teaching to suit the technology.