

Watch IT

The Risks and **Promises** of Information Technologies for **Education**

Nicholas C. Burbules and Thomas A. Callister, Jr.

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*The Risks and Promises of
Information Technologies for Education*

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 **Routledge**
Taylor & Francis Group
New York London

First published 2000 by Westview Press

Published 2018 by Routledge
711 Third Avenue, New York, NY 10017, USA
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

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Library of Congress Cataloging-in-Publication Data

Burbules, Nicholas C.

Watch IT: the risks and promises of new information technologies for education /
Nicholas C. Burbules, Thomas A. Callister, Jr.

p. cm.

Includes bibliographical references and index.

ISBN 0-8133-9083-4 (hc.)—ISBN 0-8133-9082-6 (pbk.)

1. Educational technology—United States. 2. Education—Technological innovations—United States. 3. Educational anthropology—United States. 4. Information technology—United States. I. Callister, Thomas A. II. Title.

LB1028.43.B87 2000

371.33—dc21

99-049176

ISBN 13: 978-0-8133-9082-6 (pbk)

*“The web of our life is of a mingled yarn,
good and ill together . . .”*

—William Shakespeare, *All's Well That Ends Well*, Act 4, Scene 3



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ACKNOWLEDGMENTS

The authors would like to thank Cathy Murphy of Westview Press for her encouragement and support at every stage of the writing of this manuscript. We also appreciate the excellent assistance of Lesley Rock of PageMasters & Company and Steve Haenel of Westview Press in the preparation of this manuscript for publication.

Some of this material has appeared in different forms in previous publications over the past few years, although it has been entirely reworked for the present book. We would like to acknowledge these earlier versions:

Nicholas C. Burbules, "Does the Internet constitute a global educational community?" *Globalization and Education: Critical Perspectives*, Nicholas C. Burbules and Carlos Torres, eds. (New York: Routledge, 1999). An abbreviated version was published as "Education and global communities." *Globalisierung: Perspektiven, Paradoxien, Verwerfungen. Jahrbuch für Bildungs- und Erziehungsphilosophie Bd. 2*. Walter Bauer, Wilfried Lippitz, Winfried Marotzki, Jörg Ruhloff, Alfred Schäfer, Christoph Wulf, eds. (Schneider Verlag: Hohengehren, 1999): 125–141.

Nicholas C. Burbules and Thomas A. Callister, Jr., "The risky promises and promising risks of new information technologies for education." *Bulletin of Science, Technology and Society*, Vol. 19 No. 2 (1999): 105–112.

Nicholas C. Burbules and Thomas A. Callister, Jr., "A post-technocratic policy perspective on new information and communication technologies for education." *Educational Policy*, James Marshall and Michael Peters, eds. (Gloucester, UK: Edward Elgar, 1999, 788–797).

Nicholas C. Burbules, "Questions of content and questions of access to the Internet." *Access*, Vol. 17 No. 1 (1998): 79–89.

Thomas A. Callister, Jr., and Nicholas C. Burbules, "Paying the piper: The educational cost of the commercialization of the Internet." *Electronic Journal of Sociology*, Vol. 3 No. 3 (1998). An online, refereed journal: www.sociology.org/content/vol003.003/callister.html.

Nicholas C. Burbules and Thomas A. Callister, Jr., "Access to new educational technologies: Democratic challenges." *Critical Forum*, Vol. 5 No. 1/2 (1997): 32–41.

Nicholas C. Burbules, "Privacy, surveillance, and classroom communication on the Internet." *Access*, Vol. 16 No. 1 (1997): 42–50.

Nicholas C. Burbules, "Misinformation, malinformation, messed-up information, and mostly useless information: How to avoid getting tangled up in the 'Net.'" *Digital Rhetorics: Literacies and Technologies in Education*—

Current Practices and New Directions, Chris Bigum, et al., eds. (Canberra, Department of Employment, Education, Training, and Youth Affairs/Brisbane, Queensland University of Technology, 1997), 109–120. Republished as “Struggling with the Internet,” *Campus Review* (Aug. 13–19, 1997): 19–22.

Nicholas C. Burbules and Thomas A. Callister, Jr., “Who lives here? Access to and credibility within cyberspace.” *Digital Rhetorics: Literacies and Technologies in Education—Current Practices and New Directions*, Chris Bigum, et al., eds. (Canberra, Department of Employment, Education, Training, and Youth Affairs/Brisbane, Queensland University of Technology, 1997), 95–108.

Nicholas C. Burbules, “Rhetorics of the Web: Hyperreading and critical literacy.” *Page to Screen: Taking Literacy into the Electronic Era*, Ilana Snyder, ed. (New South Wales: Allen and Unwin, 1997), 102–122.

Nicholas C. Burbules and Thomas A. Callister, Jr., “Issues of access and equity for new educational technologies.” *Insights*, Vol. 32 No. 1 (June 1996): 9–11.

Thomas A. Callister, Jr., and Nicholas C. Burbules, “Public spaces and cyberspace: Issues of credibility in educational technologies.” *Insights*, Vol. 32 No. 1 (June 1996): 11–14.

Nicholas C. Burbules and Thomas A. Callister, Jr., “Knowledge at the crossroads: Alternative futures of hypertext environments for learning.” *Educational Theory*, Vol. 46 No. 1 (1996): 23–50.

Papers based on this material were presented at the following universities or conferences: University of California (Berkeley), University of Illinois (Urbana/Champaign), and Pennsylvania State University, all in the U.S.; Central Queensland University, Cowan University, Deakin University (Geelong and Burwood campuses), Griffith University, Macquarie University, Queensland University of Technology, and University of Queensland, all in Australia; University of Canterbury and University of Waikato, in New Zealand; the American Educational Research Association; and the American Educational Studies Association. We appreciate the feedback, criticism, and advice given by audience members on all of these occasions.

Finally, we wish to thank personally those who have read and commented upon portions of this manuscript in one form or another and have helped us to improve it: Joyce Atkinson, Chris Bigum, Nicole Bishop, Geof Bowker, Chip Bruce, Barbara Duncan, Noel Gough, Zelia Gregoriou, Bill Green, Carolyn Haythornthwaite, Alaina Kanfer, Jane Kenway, Michele

Knobel, Colin Lankshear, James Levin, Allan Luke, Carmen Luke, James Marshall, Ralph Page, Michael Peters, and Ilana Snyder.

This book is dedicated to our children, who are growing up in a different world from the one we have known.



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THE RISKY PROMISES AND PROMISING RISKS OF NEW INFORMATION TECHNOLOGIES FOR EDUCATION

This book is about a different way of thinking about technology issues in education. We are not primarily interested here in addressing questions such as, “Are computers good for teaching? Does the Internet help children learn?” and so on. In fact, we think that such questions are fundamentally misframed, and represent a way of thinking about technology that needs to be reconsidered. No one would think today to pose questions such as, “Are blackboards good or bad for teaching? Do textbooks help children learn? Does television promote or inhibit educational opportunities?” We do not ask such questions because we take it for granted that these familiar elements of classroom and social life can be used well or badly, that they have advantages and limitations, and that the key issues concern *how* they are used, by whom, and for what purposes. One of the main ideas of this book is that the familiarity of certain objects, materials, and practices makes them relatively invisible to us as “technologies.” Most people no longer view their use as involving conscious choices, choices that could have been made differently, choices that reflected deeper values and assumptions that might be questioned. They are simply part of the way things are.¹ Newer technologies, such as computers, software, or the Internet, are more apparent to us. They are strange, mysterious, and sometimes even threatening. So they are problematized in ways, and for reasons, that do not get applied to other choices that are every bit as much debatable (even if society regards them as no longer subject to debate).

But the word “choice” here obscures a deeper issue as well: in many instances, the introduction of new technologies into complex social practices and institutions is not a matter of specific choices, but a constellation of changes, some active, some passive, some intentional, some only evident

in hindsight. There may be a brief moment when a key decision or choice is made, but it is rarely, if ever, made in full awareness of alternatives to and implications of that choice; and it is often quickly enveloped by ancillary changes that swamp the significance of that first “choice.” New technologies in education have *become* an educational issue, a challenge, an opportunity, a risk, a necessity—all of these—for reasons that have little to do with willful choices made by educators. Once computers and the Internet became widely available and affordable in this country, for example, it was *no longer* a choice subject to educators’ control whether they would become important to jobs, to entertainment, to social interaction, and to a host of learning opportunities outside of the control of schools at all levels. Now that this has happened, schools might try to avoid some of these issues, but, stated simply, they can no longer choose whether these technologies are educationally relevant or not. If they neglect them, that too becomes a decision with consequences that extend beyond what schools can control.

Our primary purpose here, then, is to explore what it means to think about new technologies in education in ways that we do not think simply in terms of selecting and “using” technologies for our purposes. The overall effects and relations of technologies cannot be understood simply in terms of our means/ends intentions. Nor do we believe that these effects can be easily separated from one another, or classified (in many cases) as straightforwardly “good” or “bad.” Technological change is a constellation of what is chosen and what is not chosen; what is foreseen and what cannot possibly be foreseen; what is desired and what is not. Hence the title of this chapter: risky promises and promising risks. We believe that this way of approaching the question will better enable us to confront the difficult, conflicted alternatives that face our educational activities and policies today. New technologies will become, have already become, indispensable to the practices of schooling, for better or for worse (or, as we tend to say it, for better *and* for worse).

In this opening chapter, we want to develop the conceptual and value orientation that guides the remainder of our arguments. Briefly, this orientation is built around three challenges to conventional thinking about new technologies and education. First, questioning the phrase “information technologies” as a way of characterizing some of these technologies; second, proposing a relational (as opposed to instrumental) view of technology; and third, arguing for what we call a “post-technocratic” policy perspective, a different starting point for thinking about the ifs and whys of new technologies for teaching and learning. The other chapters in this book will explore a number of current controversies surrounding new technologies

and education (access, credibility, hypertext, critical Web literacy, censorship, privacy, commercialization, and community). These are *meta-issues*, in the sense that they are overarching to particular issues of teaching and learning; they direct critical reflection to the assumptions and implications that guide particular teaching/learning practices and trace out some consequences of those practices that may not be immediately apparent. If the framework developed in this opening chapter is beneficial, it will allow these issues to be considered in a different light. It will make more apparent the inherently complex (and often contradictory) nature of our choices in this context, and by making those choices more obviously problematic, make it more difficult to take these technologies for granted or to see them merely as “tools” that we can “use” to make our teaching “better.” We have the somewhat grandiose ambition to change the terms of debate in some of these areas, to question some unfruitful dichotomies or forced alternatives, and generally to go beyond the simplistic value positions of boosterism (new technologies will save the schools) or rejectionism (new technologies will destroy the schools).²

“INFORMATION” TECHNOLOGIES

In our title we invoke the common label “information technologies” (IT). But already this is inadequate. The *information* metaphor captures an important part of what some of these new technologies have to offer, and it is a far from trivial benefit. For students in schools (and outside them) to have access to a vast library of information sources, statistics, quotations, graphic images, sound files, video clips, and other sorts of data is a tremendous educational resource. If these technologies did nothing more than this they would be of tremendous potential value. But the information metaphor is sorely inadequate, for a number of reasons.

First, there is a givenness to the idea of “information.” As with words like “fact” and “data,” “information” seems to suggest something taken for granted, to be weighed for significance, to be put together with other pieces of information to suggest conclusions, and so on, but—as people say—“raw.” This assumption obscures not only the crucial point that much of what poses as “information” is in fact partial, biased, or simply false. But even more profoundly than this, information is never “raw.” Researchers use the phrase “cooked data” to suggest information that has been made up or altered to fit pre-existing conclusions.³ But actually information is always cooked (as opposed to raw): it is always selected, filtered, interpreted, and extracted from a background set of assumptions that are implicit (rarely

explicit) in the “information” itself. This does not make the information false, or worthless; but it is in no way “given,” even for the most widely accepted and obvious of “facts.”⁴ Not long ago, students were routinely taught the “fact” that Columbus discovered America in 1492. Today we scrutinize words like “discover” with a different evaluative lens, and that “fact,” that piece of information, is no longer assumed to be true as such.

Second, the new technologies we are most interested in here (computers, Web pages, the Internet) cannot be understood simply as information technologies. They are also *communication* technologies. While some models of communication characterize communicative relations simply as an exchange of information, this is a very superficial characterization. We do send and receive information, through all sorts of media, in communication. But as the philosopher Ludwig Wittgenstein points out, there are many “language games,” each with different rules and purposes: joking, apologizing, praying, cajoling, singing, questioning, protesting, pleading, and so on.⁵ None of these can be understood in anything like the full richness of human practice as simple exchanges of information.

Bertram Bruce and James Levin offer a very useful taxonomy for capturing the variety of so-called “information technologies” and their many uses by adapting four categories borrowed from John Dewey: inquiry, communication, construction, and expression.⁶ For Dewey, these represented four basic interests of the learner, human inclinations that motivate the activities that make learning possible. Bruce and Levin ingeniously expand these categories to include a rich subset of technology-based activities in each of the four areas, and classify particular kinds of hardware and software according to each subtopic. The result is a multifaceted view of the kinds of teaching and learning activities that can be supported by various new technologies, very few of which can be captured by the idea of accessing, archiving, or disseminating “information.”

Third, and even more fundamentally, these new technologies constitute, not only a set of tools, but an *environment*—a *space*, a *cyberspace*—in which human interactions happen. The Internet is increasingly becoming a context in which interactions that cut across and combine the activities of inquiry, communication, construction, and expression are occurring. More and more the Internet is described as a “public space,” a place where people gather, discuss, and debate issues, like the ancient Greek *agora* or the community town hall. It is described as a collaborative environment, in which researchers or creative workers share ideas, co-construct new ideas and understandings, and design new products. The Internet is seen as one of the central engines to the growth of a “global” context, spanning particular

locations of space and time, fostering human relations that inhere always and only within that environment, not as a substitute for “real, face-to-face interaction,” but as the only environment in which such relations can exist at all—indeed, relations that have unique characteristics and distinct advantages (as well as disadvantages) compared to face-to-face relations.

Hence, even the term “medium” is insufficient, if it connotes a mere path or channel through which something (such as information) is transmitted. Here a space is an environment in which *things happen*, where people act and interact. This suggests that a richer way of conceiving of the role of technologies in education is not as a “delivery system” through which teachers “provide” information and learners “access” it. Rather, it is to think of these technologies themselves as a potential collaborative space, a place where teaching and learning activities can happen. These collaborations can bring together people who cannot possibly interact in face-to-face ways; or can bring together people in a *way* that cannot be accommodated in face-to-face encounters. As we will discuss, this does not make these technologies (or their effects) always benign or even neutral, and the spaces fostered by these technologies can be incomplete, distorting, or exclusionary. But in this they are no better or worse than any other social space.

Hence, as a first step, we want to question the centrality of “information” as a way of characterizing these new technologies for education. Apart from oversimplifying the range of purposes these technologies can serve, and the variety of teaching and learning interactions they can support, this characterization also tends to reify what these technologies supposedly give access to (“information”) and to obscure the active social processes by which information is actually made humanly useful.

INFORMATION “TECHNOLOGIES”

Another set of reflections questions some of the conventional ways in which people talk about technology. Two types of rhetoric dominate current discussions. One is to view technologies as tools, things to use to accomplish specific purposes: a coffee-maker makes coffee, a down jacket keeps you warm, a word processor is an electronic typewriter, and so on. This *instrumental* view externalizes technologies, views them as fixed objects with a use and purpose. One decides whether to adopt them by considering their use and purpose, considering their cost, and weighing costs and benefits.

There are a number of problems with the instrumental view.⁷ Tools do not only help us accomplish (given) purposes; they may create new purposes, new ends, that were never considered before the tools made them

possible. In these and other ways tools change the user: sometimes quite concretely, as when the shape of stone tools became a factor in the evolution of the human hand; or sometimes as an influence on human culture and values. Tools may have certain intended uses and purposes, but they frequently acquire new, unexpected uses and have new, unexpected effects. What this suggests is that we never simply use tools, without the tools also “using” us. We never use technologies to change our surroundings without being changed ourselves (sometimes in recognized, sometimes in entirely unrecognized and unexpected ways). The relationship with technology is not just one-way and instrumental, but two-way. Here we will call this a “relational” view of technology.⁸

This relational view helps to highlight two important points. One is the way in which the very distinction between human and technology is never clear-cut. As just noted, there are the fairly specific ways in which we are changed, culturally and psychologically, by the technologies we use—this point, we think is fairly clear. But there is also a quite concrete, material interrelation. Our bodies, our health, the physical environment in which we try to survive, are altered as well. Physical maladies that were once rare now become commonplace (carpal tunnel syndrome, for example). Our posture, our capacities for strength, dexterity, and coordination, the way our eyes move and process information, and on and on, all change with new technologies. New technologies affect the ways that we think about our physical selves as well. New imaging techniques and new biochemical tests change the way that we understand the conditions of health and sickness. Categories of “disability” get redefined, and new ones emerge, as we rethink our abilities relative to the new tasks we expect to be able to perform (or others that seem no longer so important to perform). Finally, technologies enter our bodies and change them in very specific ways: prostheses and artificial joints, pins and staples to hold together broken parts, pacemakers and chemical substitutes to help regulate the body’s own metabolism and processes. The Human Genome Project, a massive effort to map our DNA code, with the express purpose of allowing genetic modification of human characteristics, would be impossible without the power of supercomputers. It is no exaggeration or metaphor to accept Donna Haraway’s once-shocking claim that we are all cyborgs now.⁹ In a relational framework, this means rethinking not only the nature of “technology,” but the nature of ourselves.

The other way in which a relational view of technology is important is to recognize the way in which choices about technology use (to the extent that these are consciously and collectively decided) always stand in relation to a