ABSTRACT

This review essay cum discussion paper outlines areas of concern with the underlying terms and conditions of the use of information and communications technology (ICT) in education. The books that instigated this foray (Barrell, 2001; Cuban, 2001; Maeroff, 2003) are representative of the field and represent inquiry and opinion that reflect uncritical and critical acceptance and implementation of ICT as both a curricular agenda and device. Each book lays tiles in the mosaic of discourse surrounding the inexorable and ubiquitous overlay of ICT in everyday life as germinated in classrooms for a variety of well-intentioned but often misguided and wrong-headed reasons. The hopes, dreams, and drama that form the core issues arise from a deeper “who’s steering the boat?” tension. Does ICT serve education, or does education serve ICT? Because education is redefined as a means to social mobility and is connected to status, its commodification challenges the Deweyan notion of “education for the purpose of further education,” and transforms it into the pursuit of more adept consumerism only attainable by degree. Promotion and policy development at all levels draw special attention to the increased earning power that further education brings, thus validating its worth.
Other writers and thinkers have tweaked this particular aspect of commercialized learning, including Kehl (2004), Kohn (2004), Noble (1998), Nordkvelle and Olson (2005), and Postman (1985, 1993). Combining their perspectives in the context of global movement toward education as a trade in service, a culture of name-branding, competitive accreditation, knowledge ownership, and hegemonic determinism seems inevitable. The likely-to-be postponed signing of General Agreement on Trade in Services (GATS) (due January 2005; see Kehl, 2004) will temporarily defer the commercialism of higher education, but will not draw much attention nor encourage further debate in the to-ing and fro-ing on the meeting grounds of cross-cultural credentialism and the commodification of teaching and learning unless alarm bells are rung.

**INTRODUCTION**

This article arose from of a review of three books having to do with the use of computers and information technology in classrooms. On one level, such an opportunity allows the essayist to paint pictures of the trials and tribulations of implementing and understanding educational technology reported by editor Barrell (2001) and writers Cuban (2001) and Maeroff (2003), and to issue numb platitudes claiming their work as signposts on the ever-expanding, increasingly successful and sophisticated information highway system. Such an approach affords a polite platform from which the authors’ cares and cautions could be added to a growing and increasingly dense pile of descriptive literature detailing the wows and woes of change.

Instead, an opportunity exists to offer a critical perspective on issues that will seriously affect future relationships between Information and Communications Technology (ICT) and education. The ideas and research of Kehl (2004), Kohn (2004), Noble (1998), Nordkvelle and Olson (2005), and Postman (1985, 1993) help develop a thesis and create a picture of the global influences that ICT may have on education, knowledge, and those whose lives are directly and indirectly touched by learning and teaching. Their arguments illustrate an uneasy relationship between progress and conservation of the essentials of humanity, and the humanistic pursuit of knowledge and wisdom. Global and local distributions of wealth, power, and policy development seem to tilt the balance in favor of commerce based on human capital and on the commodification of learning and teaching.

Proponents argue for ICT in education as a necessity for up-to-date learning and teaching that prepare students for real life and the futures that might be theirs. The mosaic of discourse about ICT is patterned with how-to guides, testing and implementation of programs and special applications, policy development for use, funding initiatives, and other such matters that assume acceptance, use, and benefits as foregone conclusions. Providers of ICT, associated producers of educational materials, government officials, and administrators of educational institutions have enthu-
siastically joined forces by forming partnerships, finding champions with funding, and fashioning legislation that makes technological dreams a growing reality.

Barrell (2001), Cuban (2001), and Maeroff (2003) described the march of technology into the classroom at all educational levels as well under way. It seems a little late to ask about what the dream for ICT in education was and is, what it looks like, where it might lead, and who owns it. With this perspective in mind, an overview of how the reviewed authors see the present field of computers in education is presented. Following that, a number of issues will be addressed that place these books in a larger perspective of ICT and computers in education.

CRITICS AND CHEERLEADERS: ICT IN PROSPECT AND RETROSPECT

Barrell (2001), Cuban (2001), and Maeroff (2003) prepared the ground for important and necessary further conversations about ICT in education. Each volume has its own merits and is shelf-worthy as a text or resource for learners, teachers, and others with interests or responsibilities affected by ICT. They provide a practical orientation to ICT, the terms and conditions of its implementation, what ICT has been and is used for, and the instructional and organizational outcomes and implications for educational stakeholders.

Each author assumes ICT as a permanent feature in the landscape of teaching and learning. Details are provided regarding government policy development, funding allocations, and large- and small-scale studies, creating a trail leading through school districts and universities and ending up in the classroom, in the lecture hall, and at home. Considered en masse, they create a platform for further identification and discussion of some of the opportunities and persistent problems with ICT in learning and teaching at all levels of education. The brief treatment that each book receives in the following paragraphs should be taken as reader enticement for further examination and thought rather than disrespect for the writer.

Barrie Barrell (2001), editor of *Technology, Teaching and Learning: Issues in the Integration of Technology*, provides a collective statement about how educators deal with changed delivery circumstances and how they must or might think, act, and anticipate in order to facilitate the challenges brought by ICT. Barrell’s introduction to the book declares aims of “the reform of education, the improvement of pedagogical theory and the presentation of alternative ways of proceeding based on an examination of what is being attempted by educators and researchers of good will” (p. 27). Fourteen chapters mix mild caution with uncritical acceptance and lead learners up to and through the gates of the electronic academy. The thoughts and research of the contributors represent accounts of how some practi-
tioners meet the challenge of legislated implementation, and of understanding and adapting ICT in schools, classrooms, and academic life.

In the first section, the philosophy and logistics of implementing ICT in schools and in the lives of those connected with education are explored in “The Hand-made’s Tail: A Novel Approach to Educational Technology” (Michele Jacobson & Ricki Goldman), with rich allusions to Margaret Atwood’s work that send the reader scrambling back to her original text, while searching phone listings for a metaphor abuse hot line. “The Stewardship of the Intellect” (Pat Clifford & Sharon Friesen) and “Object Lessons: Critical Visions of Educational Technology” (Suzanne De Castell, Mary Bryson, & Jennifer Jenson) provide an expanse of philosophical and practical matters addressing responsibility, utility, and meanings derived from endorsement and commitment to the use of ICT. “Singing up the Country” (Rob Cohen) is a novel narrative approach to cybertext as a way of understanding middle school writing by bridging the storied and written selves, showing possible routes into adolescent processes that affect teaching and learning relationships. “Factors Affecting the Adoption and Use of Instructional Devices” (George H. Buck) brings ICT-required adaptations in line regarding availability, need, and fiscal matters by proposing a model that reduces the haphazard approach to adopting innovations.

The second section is a collage examining implementation of uncertain technology in uncertain circumstances. “Tearing Down the Walls: New Literacies and New Horizons in the Elementary School” (Heather Lotherington, Mary Leigh Morbey, Colette Granger, & Lara Doan) shows a full embrace of technology, with a view of how teachers and schools go about conforming to governmental and administrative expectations for implementing ICT in schools. Findings are offered as signposts for future schools en route to fuller use of computers. “Three Case Studies of ICT in Teaching and Their Implications for Practice” (Herbert H. Wideman & Ronald D. Owston) examines online programs and the care and caution needed when creating a virtual learning environment. “The Integration of Robotics Into a Grade Two Classroom” (Mary Cameron & Barrie Barrell) examines choices that students made about using advanced technological devices and applications in learning and problem solving by asking, “how does technology help represent student learnings, beliefs, perspectives, arguments and encounters with the world?” and showing the variety of situations leading to acceptance and context for inclusion and collaborative learning. “Virtual Schooling: Integrating Schooling Into Technology” (William J. Hunter & Rosina Smith) questions the direction of integration of schooling and technology, and examines the likely change and reform that will result from widespread implementation. The authors conclude that the virtual classroom and school helps some who might be missed, but carries connotations of competitiveness and territoriality. ICT is argued as part of education, not as a viable substitute, and the authors emphasize the importance of choice.
“The Many Faces of ICT Leadership for Digital Technology and Canadian Pedagogy” (Dianne Yee) summarizes the author’s experiences as teacher, learner, and specialist in ICT school-based applications, indicating that leadership means championship and provision of resources and training essential to accepting ICT’s presence in schools. “Inverted Hollywood: The Pitch for e-Knowledge Meets Pre-Service Teacher Education” (Lisa Kortweg) uses an effective metaphor of a movie pitch structure to illustrate the integration of technology. Finding that although tools and features of technology are easily changed but learning needs are not, the author notes that unless collaboration in adopting technology exists, services may be offered that are not wanted and not understood. “Computers in Humanities Education: Five Teachers Examine the Issues” (Jim Greenlaw, Natasha Boudreau, Jill Burry, Marilyn MacLean, & Mary Ann Murrin) presents discussions between graduate students in an online course. Demonstrating the merits of ICT in the humanities and providing references for resources, the authors show how enthusiasm can bring about change in thinking about and practicing teaching. “Issues of Educational Uses of the Internet: A Case Study of Pre-Service Mathematics Teachers” (Judy M. Iseke-Barnes) identifies new teachers’ concerns about accessing information from the Internet, and analyzes their issues against a theoretical background that includes strategies for accessing and using information. “Classroom Management in the Networked Classroom: New Problems and Possibilities” (Elizabeth Murphy & Thérèse Laferrière) presents a situation-reflection dynamic to discuss emergent issues in the classroom as technology (specifically the Internet) is adopted into classroom practice. Rethinking practices and assumptions about teaching and learning is advised as one way of easing the transition.

In the foreword to this volume, John Willinsky calls for sharing the need “to push technology optimistically, hopefully, into what we have always wanted of education . . . to see how it can extend the intellectually engaged and democratic aspects of education as a right of all, for the good of all, on a global basis” (p. 16). Willinsky concludes his comments by drawing on the ideas of Matthew Arnold, cautioning readers about this brave new world, which seems to lie before us like a land of dreams . . . so various, so beautiful, so new, calls for, in equal measure, a testing of whether these machines can carry us some small distance beyond the darkling plain, and an ability to say no at times, when the machines fall short of what it means to be educated in any sense by which we can happily, proudly abide. (p. 16)

Larry Cuban’s (2001) Oversold and Underused: Computers in the Classroom views technology as yet another reform movement in education. He points out that school reform has a significant history and social philosophy from which current practices have departed. He illustrates this departure with an example of Horace Mann’s support for public education in the 1830s, and argues for the desirable effects of employee literacy for businesses.
However, Cuban notes, “Mann never argued, as current reformers do, that education is a servant of the economy. Nor did he ever urge schools to operate as business. Tax-supported public schools had a civic and moral mission that far exceeded the narrow economic aims of for-profit private corporations” (p. 8). Cuban also argues that “a loosely tied national coalition of public officials, corporate executives, vendors, policy makers and parents have included in their reform agendas the common goal of creating more access to new technologies in schools” (p. 12). The goals uniting the “disparate but powerful ad hoc coalition” were to make schools more efficient and productive than they currently are; to transform teaching and learning into an engaging and active process connected to real life; and to prepare the current generation of young people for the future workplace.

These goals, linked by policy and politics, provided billions of dollars in funding for technology. Cuban posed three questions to educators in California’s Silicon Valley regarding how technology is used in schools: where it is available, the actual changes in teaching and learning since adoption of technology, and whether investment in computers has been worth the cost. His book expands that study, providing rich detail and connections with use patterns, patronage issues, and the findings of similar studies conducted elsewhere. He examined personal and professorial computer use in teaching and learning at Stanford University, and looked for differences and unanticipated outcomes in use profiles and purposes.

Cuban looks at costs, actual use and effectiveness, and raises the “how did we get here in the first place?” question. According to Cuban, funding in the billions of dollars has been provided to introduce and maintain ICT in U.S. classrooms without any substantial claims for improvement in learning or teaching, or fully understanding the repercussions of its implementation. The need for understanding ICT in learning and teaching seems of greater urgency than the overwhelming present consensus to develop protocols and practices for legislated implementation.

His findings echo the title of his book: Oversold and Underused. In schools, the introduction and use of computers did not significantly alter the teaching practices or learning; computers were used more at home than in school, and in spite of more serious personal adoption of technology, teaching remained about the same. In the university, Cuban found that computers facilitated research and writing, underscoring the professional and organizational primacy that those activities have over teaching. Such conditions in some ways precluded enthusiastic use of ICT in lectures and presentations because of time, interest, and value. Although technology is the future, he argues that its heavy-handed adoption has not been worth the billions of dollars invested, or the countless hours of practice adaptation. Such a lack of dramatic effect on teaching practice and learning outcomes calls into question the “current excessive focus on technology use in schools (and) runs the danger of trivializing our nation’s core ideals”
Cuban’s powerful volume questions the effectiveness of ICT in schools and whether the funds allocated are worth it, given other more pressing needs for basic services. Given the complexity of what Cuban hoped to grasp, his techniques and analyses flow well and unfold with the ease expected from a veteran critical thinker and skilled writer well in command of his voice.

Gene Maeroff’s (2003) *How Online Learning Is Changing Our Schools and Colleges: A Classroom of One* is a more ambitious volume. The author presents a metaview derived from U.S. research and experiences, and tries to “take a picture of a cyclone” by describing what ICT and the Internet do, can do, and need to do. A quasi-sympathetic approach gives the benefit of the doubt to ICT, and acknowledges but does not deeply pursue arguments of advocates or opponents made elsewhere. According to Maeroff, online education is here to stay, but not at the expense of traditional models of schooling. He comments, “The Internet ranks among the most formidable foes ever to confront the intransigence of traditional education” (p. 3). Maeroff identifies and outlines, along with adoption policies and history, the major sources of concern. He addresses how institutions, teachers, learners, and the communities served by ICT education are responding. He examines how ICT services are conceptualized, designed, and delivered; the nature of electronic interactions and the role of a facilitator; adaptations required of teachers and curriculum; learner responsibility; business aspects of online learning; career development foci; legitimacy of programs; controls; level of education for inclusion; institutional redefinition; and the types of questions that still want answering. Maeroff raises the issues of faculty workload, intellectual property rights, and the change in practice and perception when students become customers. Choices must be made based on actual benefits, needs, and ability to deliver. Appropriate management and provision of services suitable to age and level of study will see online education as another stream or part of a hybrid model.

With these books as a starting point, a broader picture of ICT in schools and at work is necessary, asking these questions: Where does ICT fit into the process of change in schools and at work? Where does ICT fit into an ethical framework? What are the implications for knowledge, knowers? What is the worth of education? What lies ahead for learning and teaching?

**ICT AND THE PROCESS OF CHANGE**

**Learning and Teaching**

A “thought for the day” item in the *Globe and Mail* (Toronto) cited Bill Gates: “One thing is clear: We don’t have the option of turning away from
the future. No one gets to vote on whether technology is going to change our lives.” This “thought” should last longer. ICT has redefined learning and teaching and is well on the way to changing the future principles, practices, policies, and underlying epistemological issues that define the value, worth, meaning, and delivery of educational services.

There is no question that ICT is a valuable, useful resource and tool for learning and teaching. Rapid increases in online learning and the global economic market have identified controversies over content, process, ownership, and other terms and conditions of use. Decisions are most often made by parties whose functions are removed from the circumstances of learning, teaching, and knowledge production. Issues of transforming knowledge, knowledge production, learning and teaching activities, educational corporatization, copyright, intellectual property, legitimacy, and curricular hegemony have been slow to reach the stage of global recognition and discourse before action.

The world of ICT is large and most often chaotic for learners and teachers, whether caused by continual system and software upgrades, alterations in reporting formats, viruses, and Web site and information maintenance, or merely by wading through the effluvium of commercial sidebars on the Internet. For most educators, preoccupation with the daily management of educational life means looking for safe footing step by step, seldom pausing to look further ahead on the path or even question why certain paths are followed.

ICT is, in essence, both service and product designed to organize and speed up the flow of information. Consumers of all types purchase ICT to facilitate growth and development in countless ways. At best, it is a servant of society, business, industry, and education that improves efficiency in managing and transmitting large amounts of data. At worst, it is a monopoly of virtual fashion, promising progress for self and community in the shape of products—educational and otherwise—in the general marketplace.

Such claims, when made by such writers as David Noble (1998) and the late Neil Postman (1985, 1993), brought dismissive reactions mainly from those in financial and political relationships with education, as it is broadly defined. Well-rounded defenses of the present and future of ICT as message, messenger, and medium contain built-in counterattacks with latent implications that cast doubt on any faultfinding writer’s critical acuity, ability, and usefulness.

Questioning the ICT reality risks the label *neo-Luddite*. The real Luddites followed Ned Ludd in England and destroyed weaving machines during 1811 and 1812 because of the threat that this particular technology represented to employment and security. The machines of business, industry, and politics trumped the crude weapons of technological destruction that the Luddites wielded. Most were prosecuted, scorned, and incarcerated. Life went on, as did technological progress.
A handful of early adopters pushed for bottom-up change and adoption of computers in schools during the 1980s. They struggled for funding, learning niches, and space, and thrived as the early seeds of electronically facilitated learning were harvested. Their actions during this period ushered in a new era of change. Many teachers resisted, seeing ICT as one more trend with which they must deal. The early days of computers in the classroom often found precompetent teachers seeking assistance from preteens blessed with technological infatuation and uncompromised mental agility. Since that time, legions of teachers, professors, support personnel, and suppliers embraced ICT with the precision and grace of shotputters in a minefield. Others were swept along. Some never really got it. ICT crept through the side door into education with promises of timesaving, efficiency, and improvements in learning. In the late 1990s, higher education began to see first-generation users (those with lifelong computer exposure) with high-tech learning expectations crafted in home and community.

Too often, the view of ICT comes from advocates located inside (e.g., ICT-literate and invested students and faculty), from above (e.g., administration and government), and from outside (e.g., developers and merchants of software and hardware). Amid promises of more, better, and faster, linkages between business and industry and other partnerships providing resources often seem like marketing covered with a thin veneer of respectability and rational efficiency. Educational institutions at all levels have bought into the corporate vision—complete with strategy and consequences—and integrated it into standards of educational practice and delivery, often avoiding the question of whether ICT serves teaching and learning, or whether teaching and learning serves ICT. Further questions of motive for advocacy might also ask whether administrators serve schools and universities, or the reverse. Standing between the poles of this dichotomy are matters related to the identities of real and imagined beneficiaries and eventual outcomes visible in the social influences after generations of use.

A tangled web of circumstances has caused many educators to question not only the utility of technology, but also the origins and justification for its dominance in classrooms. Classrooms without computers indicate a deprived learning context. Creation and acquisition of smart classrooms in schools is a coup and desirable for optimized learning. ICT has moved from technology for communication of information to a curriculum creation and delivery system for teachers and learners—sometimes without the need for teachers. While thought by many to be a beneficial exploitation of technology, marching into the future of teaching and learning according to beat of the ICT drums has produced a long parade of banners without standards. There is bad news and good news. The bad news is that ICT in education is here to stay. The good news is the same as the bad news.
ICT AND THE WAY WE WORK

Technology at work is seductive at many levels. A colleague recently received a newer, faster computer with matte black finish, a big flat screen, and a wireless mouse and keyboard. I felt a slight twinge reminiscent of looking at shiny new Harley Davidson motorcycles. Another colleague has a “memory key” that he carries around. The device, about the size of a cigarette lighter, is capable of holding enough megabytes to contain all of his programs, data, and PowerPoint presentations, and can be plugged into any computer’s USB port. Still others use cameras and related digital technology for live or canned video streaming of classes, and other types of information storage and transmission. Many use multimedia presentations and Internet links during teaching, or work from prepared materials on CDs or DVDs. Web sites with instructional platforms are used for individual courses and whole programs as information-only, live and online instruction hybrids, and completely online instruction. And significant is the ongoing march of so-called digital convergence, wherein technology becomes smaller, cheaper, and more powerful. There seems much encouragement, and often funding and other rewards, for those who acquire and use such aids in teaching, research, and beyond. Promises of faster, more efficient communication and general timesaving, in addition to playing with the latest toys, is educational workplace seduction on par with reserved parking and an office with a window.

Many applications of ICT in teaching are interesting, clever, and expected by students raised in a high-tech milieu. Developments and applications from military and gaming research account for much technological progress, making equipment, information, and relationships available in ways never thought possible. The effects of technology in the classroom create reactions not unlike the experiences that teachers had during the 1970s with the first generation of media-savvy, Sesame Street-wise pupils. “Edutainment” brought production values to learning and teaching and became an increasingly invisible underlying factor in curriculum design and change. The happy combination of education and television (or is it television and education?) has created and continues to create learning possibilities and advancement for learners of all ages, whether used for informal or formal study. (A colleague recently commented that educational television seemed reserved for graduate student insomniacs or shift workers because most of the “good” programs air in the middle of the night.) The increasing sophistication of instructional media, especially through the advancement of digital and communications technology, is thought by many to be yet another happy combination for education. Taking its place in difficult, diverse, and overcrowded classrooms with constantly changing curriculum, ICT carries a mixed blessing that may lead to unanticipated outcomes.
The use of e-mail and Web surfing for background materials has simplified academic life greatly. The computer provided for use at work is also appreciated. Users must be aware that the terms and conditions of using these conveniences have an organizationally pragmatic reality. Ownership of computers, and the supporting Internet access, means that all materials created by or stored in machines is the property of the employer. E-mail is public communication. Tracking software, or spyware, provides trails that can be used not only for marketing of products delivered through spam, but also for scrutinizing reasons (e.g., security, performance monitoring and evaluation, and enforcement of moral and legal standards).

Teachers and professors facing the often coercive seduction of ICT seem caught between Luddism and acceptance of instructional media of dubious parentage that is poorly understood and seldom discussed. Curriculum, and where and how it is delivered, is not neutral even in the best of circumstances. Whether through overt or covert devices, students at all levels learn academic materials set before them. Learning in a formal setting is accentuated by further learnings of context and expected or demanded social roles played out in the situation in which it occurs. E-learning redefines the processes of information acquisition, retention, sense making, and the critical thought necessary to distinguish differences between and among data, information, and knowledge. The densely layered flood of information, hypertext links to yet more information, and the uncritical posting of opinion and purported facts mix urban legends, conspiracy theories, and lurid diversions with more valid and valuable forums for discourse. Discernment of information sources is typified by the comparison between a refereed journal in which submissions are peer reviewed and merit publication, and the more sensationalistic reporting of popular media. The debate about when information becomes knowledge occurs infrequently and illustrates the lack of a concept, appropriated from Hemingway by Postman and Weingartner (1969), called critical crap detectors.

A further example of the e-learning effect can be experienced in the process of researching literature and the development of academic writing skills and practices. Hours in the card catalogues and stacks, still of surprising value, have been replaced by online searches requiring descriptor mastery and a disk or device for downloading copies. Services provide databases, and university and school libraries purchase licenses for use; faculty, students, and the public may need to pay extra fees for copies or copying. Enterprising students will surf the Internet using any one of many search engines, and usually come up with an excessive number of hits on almost any topic, including prewritten papers. Search engines and the feel for technology seem to have overtaken more traditional methods of library research. Such faster, more efficient methods affect the accessibility and perhaps scope and usefulness of materials because database subscriptions and contents are limited. As methods of inquiry change, so will the range, scope, and depth of questions addressed, the meanings available to be
made, and the resources used to provide background, context, and information about previous explorations of subject matter.

As ICT has entered the mix, a further link is apparent with larger class sizes; ICT has made them possible, and further increases exponentially complicate teacher-learner-knowledge interactions. Term papers are increasingly requested in electronic format and submitted through Internet services (e.g., turnitin.com, to whom copyright is assigned on submission) that scan them for strings of words indicating plagiarism. As yet, no fully reliable and cost-effective system for verification of individual identification in electronic exchanges is possible. Grammar and spelling checkers provide further management of written assignments. Exams may be of the multiple-choice or other numeric type, with responses entered on scannable forms. Guidebooks and practice sessions that develop familiarity with testing methods increase performance and the likelihood of higher grades. Learning seems to have tripped over performance en route to knowledge, causing the performance-based quantification of knowledge to become further embedded in market-sensible, normal-curve ways of viewing and practicing learning and teaching.

The distance between the professor and the class is vast in spite of virtual measures taken to promote perceived interaction and proximity. The circumstances of larger classes and the delivery response facilitated by institutions seem close to the full or hybrid representations of ICT experience provided by distance-learning models and methods of course production. A clear threat to instructional integrity exists when course developers assume curricular responsibility without the benefit of defensible disciplinary knowledge, scholarly review, or full understanding and support of the academic community. Avoidance of full disclosure of development and administrative practices and policies often cloaks misguided zeal for program status and revenues. Because professors account for 80% or more of most university budgets, any tactics allowable under collective bargaining provisions that will reduce expenses are fair game. Increased use of part-time and limited-term faculty and the deployment of marginally qualified facilitators delivering canned curriculum with a short shelf life are increasingly standard fare in institutions and programs that advocate ICT delivery as described by Noble (1998).

Technological mastery, organizational skills, and persistence are indicators of likely academic success. Knowledge of how to be a student in a given environment may be equally valued or even more important than what we define as intelligence, with performance more measured than learning. Teaching transforms knowledge, the knower, and the methods of knowledge production when passed from instructor to student. The directness of this connection seems strained, or at least postindustrially transmogrified using ICT. Instructional technology embedded in curriculum materials as method and process borrows heavily from the principles and practices of television and print media, and is subject to similar critique.
ICT must also be considered as content and product. As asserted earlier, no curriculum is neutral. Curriculum reflects the hegemonic values, ideals, and goals of the person, agent, or agency who creates it. Further removal of curriculum development and delivery to ICT may consider production values and marketability (as aspects of product delivery enhancements) more important than the terms and conditions of intellectual and academic engagement. If ICT-based curriculum is not neutral, on what or whose morals, values, and ethical ideals about education is it based? Questions underlying the implementation of ICT must go further and examine deeper implications, specifically those of an inclusive ethical nature.

ICT AND THE FRAMEWORK OF ETHICS

According to Nordkvelle and Olson (2005), the political process behind the implementation of ICT is grounded in the belief that “it was merely a matter of time before the machine would more or less replace the teacher” (p. 12). Citing John Dewey’s connection between the politicizing of technology (whether expressed through book, overhead projector, or timetable) and the democratic development of society, they argue that ICT implementation, because of its effect on learning and teaching, represents grounds for arguments of morality.

Proposals to pass instruction from teachers to software create tensions because of the idea of automated schools. Considering the reprise of antiteacher sentiments from the 1980s, the giving over of responsibility for reconceptualizing curricula to software developers dilutes, without sufficient ground to do so, that which is taught. Questions surrounding the validity of old or traditional ways of teaching fuel the perception of need for ICT, again without full cause or discussion. The dubious “added-value” that ICT brings transfers much power from the classroom to the institution, creating for teachers the agonies of micromanaged instruction. Whether through the uses of student data, the choice of software, enforcement of use, or templates for presentation shaping ideas, ICT is likened to a Trojan horse, with Nordkvelle and Olson’s (2005) strong advice to “look inside the horse.”

The professionalization of teachers is also deeply affected by the implementation and use of ICT, whether through the overly optimistic setting of instructional targets and goals, or through the shifting of teacher cultures. Little time exists to provide thoughtful appraisal and critique of the general and specific issues of adoption and use of ICT. Nordkvelle and Olson’s (2005) concerns relate to conversations and discourse that have not occurred, and to the ethical shifts in place that allow ICT to enter learning and teaching without fair consideration of consequences to those who study and teach, and to the society into which learners enter. Defending practices in light of technological change does not necessarily indicate
rigidity, but rather a cry for explanation, justification, and accountability as knowledge, knowing, and the knowers face changing, uncertain, and poorly thought out changes in practice and policy.

Of question and concern for ethical examination are the increasingly obvious relationships between institutions of learning and those on the supply side of edu-business. Kohn (2004) describes how learning is turning into a business. He gives accounts of how publishing companies also own and produce standardized tests, thus linking the chain of producing the test, grading the tests, and supplying materials to raise students’ scores on the tests. Further questionable relationships involve corporate sponsorships in the form advertising, soft drink monopolies, and manufacturer-supplied curriculum (e.g., hygiene, dental, and skin care).

Kohn (2004) quotes an instructor’s comment: “[W]e are preparing future college students for a brand of higher education designed and administered by the savviest segment of our society: for-profit corporations” (p. 19). The “schools as factories” metaphor allows business leaders to “write off innovative, progressive educational reforms as mere fads that distract us from raising test scores” (p. 23), further embracing technology and external control of education. Kohn strikes at the heart of the role assumed by edu-business and the practical and ethical stance that educators and concerned others might consider. He comments, “corporations . . . freely complain when they think schools aren’t adequately meeting their needs. They are not shy about trying to make over schools in their own image. It’s up to the rest of us, therefore, to firmly tell them to mind their own business” (p. 25). Admirable though this sentiment is, it may be too late. Information and education commodities have become part of the global marketplace and the densely complex system that learning has become.

ICT KNOWLEDGE AND GLOBALIZATION: FROM DARK AGES TO DENSE AGES

During the historical Dark Ages, knowledge and knowing were decimated and desiccated by ignorance, superstition, and dogmatic belief systems that governed thought and expression. Knowledge and literacy were tightly controlled by organized religion. The budding sciences grew from alchemical curiosities and technical possibilities. Literacy, intellectualism, and aesthetics fuelled the rebirth of culture, economy, and the pursuit of knowledge and wisdom. During these times, “common knowledge” referred to the propensity of an individual to be aware of, through discussion, reading, and other modes of apprehension, the mainstays that passed for the totality of knowledge in any culture.

Globalization of knowledge, knowers, and the concomitant alternative ways of knowing provided by ICT has provided an exponentially more
complex, dense, and sometimes chaotic system of filters that determine validity, reliability, generalizability, verifiability, importance, meanings, and implications of what is learned and how it is learned and subsequently reconstructed by learners.

Aspects of chaos theory derived from mathematics assist in understanding complex adaptive systems and provide an explanatory footnote assisting explanation of the attractiveness of ICT, what it represents, and the problems that it might address—or create. Humans like to make sense by establishing order among ways of thinking, organizing, adapting, and being. Acceptance of order creates a medium for culture and is expressed developmentally through the evolution of social mores and customs. As religion and science have guided different ways of thinking about origins, purpose, and beyond, the parameters of acceptance and approval for what might be read, thought, or expressed became the irresistible targets of free-thinkers and reformers who railed against extant social mores and customs, striking out at social epistemologies in the name of progress. Such challenges introduced an element of chaos into the intellectual and social order that had previously provided a stable, predictable, and secure environment.

When systems viewed as predictable and regular are perturbed in greater or smaller ways, new forms of order emerge and are recognized and acted on; knowledge and behavior adjust and paradigms shift. Sometimes new order can only be seen from a higher level in which broader society or spans of time are used for perspective setting. Order upon order, the meanings made throughout the history of fact, fantasy, and knowledge accumulate, causing successive knowers to become conceptual archeologists who sift and sort for context, continuity, and meaning while trying to comprehend culture. If one mark of culture is the search for meaning within it, the dense age of ICT has increased the magnitude of that task and confused the content, process, and outcome aspects of learning and teaching as temporally and fiscally bound objectives.

Postman (1985, 1993) expressed much alarm over intellectual and cultural decay because of the various aspects of media and technology that created trade-offs in the cycle of cultural creation and destruction—unfortunately measured by popular ratings. ICT in education is certainly a new medium of instruction. When curriculum materials are adapted for ICT uses—or repurposed, as said in media lingo—the translation is much like developing a film from a book. An idea or course of study conceived in one medium seldom survives intact when converted to another. Conversion of courses and development of new courses for ICT delivery require the teacher as course developer to review and revise content in ways that facilitate electronic distribution. When knowledge is framed for alternative modes of delivery, the ways in which the ideas and materials are known, deconstructed, and reconstructed also differ, as does the discourse to which it gives rise. Postman (1985) drew on the work of Marshall McLuhan and
considered media as epistemology, claiming that “a major new medium changes the structure of discourse” (p. 27).

Epistemology addresses the nature of knowledge, knowledge production, and relationships between knower and known. For the media, epistemology is derived from cultural measures that it claims to be significant. Postman (1985) wrote that “television is at its most trivial and, therefore, most dangerous when its aspirations are high, when it presents itself as a carrier of important cultural conversations” (p. 16). From an epistemological perspective, he labeled the subsequent public discourse as “dangerous nonsense... (that) under the governance of television... has become shriveled and absurd” (p. 16). He was a relentless critic of the unthinking adoption of technology and cautioned that “when we admit a new technology to the culture, we must do so with our eyes wide open” (1993, p. 7) because “it is a certainty that radical technologies create new definitions of old terms, and that this process takes place without our being fully conscious of it” (p. 8).

What we know and learn, how it is known and learned, and what we are ultimately able to do with these accumulations lead to questions of worth and value. These terms mean different things to different educational stakeholders.

WHAT IS THE WORTH OF EDUCATION?

A recent graduate might respond that education is worth the amount of student loans accrued and added to the mortgage on the family home. An administrator might consider the revenue and brand loyalty represented by enrollments. Teachers and professors likely think little about the worth of education unless they have a child in the process or a low salary.

Education has become a means to social mobility and enhanced consumerism. Media and government statistics provide regular indicators of the increased lifetime earnings possible with a college or university education. Further aspects of worth have to do with the access and opportunity available to degree holders. Although the qualifications held are necessary for entry into professions and other fields, the degree-granting institution and the type of program taken may also be subject to increased scrutiny. As the variations defining institutions—reputation, prestige, or specialization—add character and distinction to graduates, disparities in academic values and curriculum make transfer of credits an awkward and often contested issue. Although territoriality and brand name loyalty will compel some learners to maintain institutional allegiance, the mix-and-match program varieties based on learner and learning needs over institutional and program needs seems a more likely direction in a consumer-driven educational economy. No formula exists for equitable
assessment of specific courses of study or academic programs in terms of process, content, standing, transferability, validity, and other measures that would provide an acceptably objective global measuring stick (as would be need for a globalized education system).

The International Organization for Standardization (ISO) has begun a process of certifying the standardization of manufacturing businesses. Companies proudly display “ISO Certified” banners outside their establishments, indicating that the processes in their places of business are intelligible, reliable, and meet acceptable international standards. Can anything less be required in a global educational market? Imagine an International Educational Standards Organization (IESO) that would create international benchmarks for the terms and conditions of instruction, academic performance, required and elective curriculum, and financial agreements sufficient to provide incentives for interuniversity degree studying. From an administrative perspective, especially the registrar’s function, a massive database of what credits from one institution are worth elsewhere would be an absolute time and money saver. From a student perspective, awareness of global standing and institutional regard would be measurable by ease of credit transferability. From an academic and pragmatic point of view, an image of Sisyphus visiting the Aegean stables comes to mind. However, an IESO venture may end up as something that postsecondary institutions cannot afford to overlook.

The stakes are sufficiently high to consider such a strategy and the global trade mechanisms in place. From a financial perspective, Kehl (2004) cites surprising statistics indicating that the global education market is worth about two trillion U.S. dollars ($2,000,000,000) annually. ICT as a money-maker crept in the back door of education under the guise of progress and development. Noble (1998) argued that technological transformation of universities was camouflage for the commercialization of higher education, “for here as elsewhere technology is but a vehicle and a disarming disguise” (p. 2). The campus as a site of capital accumulation and a two-phase conversion of the university (from place of learning to location of human capital) are increasingly evident hallmarks of higher education. The first phase transformed the links between research, development, and application by deriving marketable products from science and engineering. This product focus has been most successful. The second phase deals with the process and content of teaching and the “systematic conversion of intellectual activity into intellectual capital and, hence, intellectual property . . . transforming courses into courseware, the activity of instruction itself into commercially viable proprietary products that can be owned, bought and sold in the market” (p. 3).

Noble delivers a scathing indictment for the motives, conduct, and clandestine actions of media, academic publishers, software producers, and self-interested university administrators as they have moved to extract and
transform knowledge and knowledge production. Online universities do not need faculty. Canned courses developed from co-opted materials are electronically transformed by technicians and delivered by marginally trained and qualified facilitators who are paid far less than full-time faculty. Students often find themselves unwitting participants in product development, with course feedback providing valuable information in test marketing for content, process, and performance. Academic freedom seems another casualty as changing employment conditions move away from full-time tenured faculty to limited-term and part-time appointments. Unionization of faculty seems to have been the only way to maintain or gain ground regarding the conceptions and treatment of teachers as human capital. Even so, relatively few collective bargaining agreements have found the consequences of ICT strike-worthy or of immediate and imperative concern.

Noble’s criticisms have not been well received and are even taken by some as alarmist and reactionary. Evidence does seem to have piled up more in his favor since the publication of Digital Diploma Mills (1998), if expansion of electronically offered courses and programs is any indication. A quick search on the Internet for college and university programs showed about five million hits. Twenty minutes searching with Google (July 2004) produced the list in Table 1.

These figures seem impossibly high, and yet there they are. Few of these courses or programs existed a decade ago. Coherence in academic study seems threatened because of complexities and conditions surrounding transferability of credits and the accompanying territoriality; the application of caveat emptor to education regarding status and credibility; and the simple volume of available options. What does it mean to be well educated? What will well educated mean in the future?

<table>
<thead>
<tr>
<th>Descriptor</th>
<th># of Hits</th>
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<tbody>
<tr>
<td>ICT and Education</td>
<td>1,900,000</td>
</tr>
<tr>
<td>Information and Communications Technology</td>
<td>5,220,000</td>
</tr>
<tr>
<td>Online courses</td>
<td>8,240,000</td>
</tr>
<tr>
<td>Credit</td>
<td>3,040,000</td>
</tr>
<tr>
<td>Secondary</td>
<td>362,000</td>
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<tr>
<td>Elementary</td>
<td>252,000</td>
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<tr>
<td>College</td>
<td>1,950,000</td>
</tr>
<tr>
<td>University</td>
<td>1,450,000</td>
</tr>
<tr>
<td>Online University Programs</td>
<td>4,230,000</td>
</tr>
<tr>
<td>Online College Programs</td>
<td>4,900,000</td>
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</tbody>
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WHAT LIES AHEAD?

*The most salient characteristic of life is its coerciveness: it is always urgent, “here and now” without any possible postponement. Life is fired at us point blank.*

Jose Ortega y Gasset

Too busy with learning and teaching, learners and teachers cannot wait until science and technology fully explore the process and products of learning and learning environments. Technological life has been fired at them point blank and from a short distance. Downward compression of learning expectations and upscaled performance standards have brought urgency to teaching and learning as an artifact and metaphor from the march of progress. ICT and those who benefit most from it cannot wait either, because market share and profits await. If the educational process as currently envisioned and practiced were viewed as a hypothesis about learning, successful outcomes would scarcely provide sufficient evidence for acceptance with or without ICT in schools and classrooms. The rate of dropouts, failures, and miseducative experiences that reach public ears and spark reforms diminishes whatever meager accomplishments teachers seem able to marshal. Schooling from Ortega y Gasset’s opening metaphor of “point blank” and “firing” has sufficient caliber to alert and alarm. Learning as part of life is an incoming object that cannot miss that which is in its path.

*Point blank* is to be fired at, or to fire at, by, or with some sort of projectile, invective, or otherwise intrusive peppering of physical or metaphysical effluvium. Point blank implies an imposition, an assault, and a clear and present danger to be met with a proportionate level of awareness to minimize harm and unnecessary flirtations with oblivion. ICT applied to teaching and learning expands preoccupation with speed and efficiency into a guiding metaphor for adoption and investment, and has been hitting learning and teaching point blank for some time; its lethal effects are more visible with each passing semester.

Technology, according to Bill Gates and others, is the future. Changes will come regardless of whether individuals and groups in teaching, learning, and larger society want, need, or like them. While resistance seems futile, clear thinking is imperative. While technology has been part of humanity from stone axes to Pentium CPUs, there is something sleazy about how ICT has taken hold of the teaching and learning process. (Words other than *sleazy* might have been picked, but there is a connotation of illicitness, unseemliness, and hazardness about it that captures the underlying character of events that seem to have occurred.)

Kehl (2004) describes the destination for all of these machinations and provides compelling and devastating evidence supporting Noble’s (1998) arguments. He explains an impending General Agreement on Trade in Services (GATS) arrangement under the World Trade Organization...
(WTO) that will see higher education subject to trade liberalization for 21 of 146 member countries. This agreement became effective in January 2005 and means, in essence, that higher education has become a commodity and will be treated in much the same way as steel, wheat, or wood even though these products have little to do with culture. The latter products are subject to careful scrutiny for production methods and any trade advantages available through government subsidy or circumstances that might create an unfair trade advantage. In most provinces of Canada, universities and colleges are tax-free public institutions that receive government funding based on enrollment and incentives based on key performance indicators (KPIs), and have available further funding opportunities for eligible students. Accordingly, offshore academic institutions would be entitled to identical treatment. Otherwise, complaints of unfair trade practices could be brought to the WTO and dealt with according to the same principles applied to other trades and services.

This aspect of GATS originates from the United States and represents all business and industries interested in and prepared for global economics and marketing of educational and learning products. Nowhere is preparation more evident than among the technology leaders cited by Noble (1998), including “Apple, IBM, Bell, cable companies, Microsoft, the edutainment and publishing companies Disney, Simon & Schuster, Prentice-Hall et al.” (p. 5). To these may be added the thousands of institutions offering online programs of all types, with all sorts of terms, conditions, and costs. Niche marketing and aggressive advertising campaigns often linked to business and trade have led to unusual partnerships and collaborative programming initiatives worldwide, and speak to globalization with hidden costs, conditions, and consequences. The songwriter Tom Waits described how “the large print giveth and the small print taketh away.”

The WTO/GATS international legislation has received little attention in part because of the language and tentative wording of provisions and the less-than-public nature of its agenda. Some countries are in favor of this agreement because it will provide access to courses, programs, and other curriculum too expensive to develop. Additionally attractive is exposure to Western ways of thinking and the creation of knowledge links throughout the world community of business and industry. Of lesser concern seem issues of conflicts in hegemony, belief systems, and cultural history. If producers of courses and programs reflect the character of the culture in which it was produced, then that culture is transmitted along with learning as a hidden aspect of curriculum.

As home to the major producers of educational materials and owners of the largest online learning delivery service in the world, the United States has the foundation, the will, and pending international agreement to pursue an educational foothold throughout the world. With rifts caused by religion, politics, human rights, and wars and other acts of aggression,
matters of corporate conscience seem to trump humanism consistently. If education is business, then those in education must compete, be shut out, or find places where humanism and elegance of thought reside. Upton Sinclair explained communication between and among competing stakeholders: “It is difficult to get a man to understand something when his salary depends on his not understanding it.” Whether the full impact of ICT on learning and teaching is understood before all control for education passes out of the hands of educators and into the hands of administrators and corporate opportunists will only be seen over time, and only influenced through the careful examination of cause and consequence.

REFERENCES