

20th Anniversary Volume

Adult Education in a Technological Society

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The request that appeared in my e-mail in-box to write an article that would “broadly address the impact of technology on adult education—not just elearning/DE but also the broader social and psychological implications of technology’s explosive growth” was both appealing and appalling: appealing because I have some views on the topic that I’m always eager to share, but also appalling in considering the breadth of the topic and the relatively short space within which to address it.

Given the latter point, I need to be clear with readers that my response can be only impressionistic and partial; another person’s analysis would emphasize other aspects of the topic and, given more time and space, could certainly be more comprehensive.

Where to Start?

“Begin at the beginning and go on till you come to the end: then stop.” (advice from the King to the White Rabbit in Lewis Carroll’s, *Alice’s Adventures in Wonderland*)

Good advice, but easier said than done. Where is the “beginning” of the complex inter-relationship of technology and adult education? Adult education operates within a nested series of contexts: the personal, the organizational, the institutional (with “institution” here meaning the abstract social idea that represents a broad area of human activity such as education, the military, healthcare, etc.), the social, and the global. Comprehensively examining the impact of technology at all of these lev-

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els and in their inter-relatedness would be impossible, in part because those levels, the technologies themselves, and their relationships are ever-changing phenomena. For manageability, I'll focus my examination somewhat narrowly on two questions as they relate to adult education in the U.S.:

1. Briefly, how have social changes related to technology, particularly information and communication technology (ICT), influenced the context within which adult education operates (that is, technology and adult education)?
2. How has the proliferation of ICT directly influenced the field of adult education (that is, technology in adult education)?

Technology and Adult Education: The Social Context

A necessary first step is to define "technology," another somewhat daunting task. Technology is certainly more than tools and machines, especially within a highly developed society. Chandler (2000) notes that "In common and academic usage, the word 'technology' is variously used to refer to tools, instruments, machines, organizations, media, methods, techniques and systems" (para. 1).

While recognizing that many types of technologies have contributed their influence to society and education, the primary focus of this article is information and communication technology (ICT), that group of technologies that has arguably had the primary recent impact on both contexts. Even within this narrower category there are variations in use and impact, but for ease of discussion ICT will be discussed as a general category that includes those technologies identified by the International Telecommunications Union (ITU, the United Nations agency for information and communication technology issues): fixed and mobile telephony and fixed and mobile computer technologies connected to the Internet (ITU, 2010).

Social Impact of Technology

There have long been two competing views of the impact of technology in general on society: the utopian and the dystopian. Burnett, Senker, and Walker (2009), in *The Myths of Technology*, offer a simplified version of these two perspectives:

1. Technology is the answer to all our social, economic, political, medical ills, etc.
2. Technology will bring death to millions and is the harbinger of the destruction of civilization (p. 11).

A recent report from the Pew Research Center's Project for Excellence in Journalism (2010) notes that mainstream news media present the American public with conflicting but primarily positive messages about how information technology influences society:

The most prevalent underlying message about technology's influence has been upbeat—the notion that technology is making life easier and more productive. Nearly a quarter of all technology stories studied from June 1, 2009, to June 30, 2010, conveyed this idea. But that was closely followed by the sense that with convenience comes risk—to our privacy and particularly to our children—which made up nearly two-in-10 stories, according to the study. (para. 3)

Of course, more useful than either extreme is a view that recognizes not only the complexities and tradeoffs involved in the social integration of any technology, but also the responsibility of groups and individuals to make technology decisions based on an informed and nuanced understanding of technology. Often, however, clear decision-making is hampered by the extent to which technology has permeated the very fabric of our social world, making it difficult to examine and evaluate it as something separate from ourselves and our day-to-day personal and/or work lives. Our relationship to technology is unlike our relationship to other categories of tools. It serves us but at the same time drives us. It expands our horizons and our reach while at the same time tethering us to our information and communication devices. Nowhere is this complex relationship illustrated so starkly as in the language associated with it.

How Language Shapes our Relationship to Technology

The rhetoric in which we speak (and are spoken to) about the world in which we live, of how we fit into it—or don't fit into it—is perhaps the strongest evidence of the impact of ICT on current society. Hacking (cited in Appiah, 2005, p. 65) suggests that “numerous kinds of human beings and human acts come into being hand in hand with our invention of the categories labeling them.” And, while they may originally have reflected changes in society, many of the labels now seem to drive social

change. Increasingly, our labels both reflect and shape a world permeated by ICT.

Most fundamentally, we're told by a variety of sources—the popular press, government documents, higher education institutions, research “think tanks,” to name a few—that we live in the Information Age in an Information Society. The ideal of such a society is one “in which everyone, everywhere, has access to ICTs and access to information (Touré, 2007, para. 6). This labeling of our temporal and social positionality leads to other labels. In our Information Society we have a knowledge-based economy to which we are expected to contribute. In this effort we're more valuable if we are knowledge workers. It thus becomes our responsibility to get knowledge (and to keep getting it) so that we're personally not “left behind” and because by doing so we can help “keep the nation competitive in the global, knowledge-based economy” (Lumina Foundation for Education, 2010). National success is reflected in a high score on the World Bank's Knowledge Economy Index, one element of which is a nation's level of ICT development (World Bank, 2010).

Other ICT-related labels categorize us, evaluate us, and pressure us towards specific social ends. We're told that there's a digital divide that separates the ICT “haves” from the “have-nots” and, further, that there is a proficiency divide—“the gap between those who have the blend of cognitive and technical capabilities required to negotiate information demands in the academy, or the workplace, or society, and those who lack them” (Educational Testing Service, 2003, p. 3). Both of these ICT-based gaps must be bridged to prevent “a weakened society, one with fewer informed voters and citizens, fewer productive workers, fewer lifelong learners” (p. 7).

The message further continues that these divides are not merely cultural and economic, but also generational: deficient digital immigrants (those born before the ICT “revolution”) are said to lag behind the younger digital natives, those raised and supposedly competent in a ICT-rich environment (Prensky, 2001). In government reports young people are labeled the digital generation (U.S. Department of Education, 2004); headlines in trade publications proclaim “Millennials defined by technology use” (Krigman, 2010); and the popular press warns of the dangers facing the “‘toxic’ Web generation” from self-induced over-exposure to ICT (Clark, 2009) and from cyber bullies and sexters (Internet Broadcasting Systems, Inc., 2010).

Indeed, these labels and language can leave us wondering, are we defining technology, or is it defining us and our priorities? This uncertainty and ambiguity is itself reflected in the language of ICT-focused titles such as “Is Google Making Us Stupid?” (Carr, 2008), *You Are Not a Gadget* (Lanier, 2010), and “The Machine is Us/ing Us” (Wesch, 2007).

How Technology Shapes our Relationship to Itself

Language is powerful but is not the only “shaping” factor related to technology. Jaron Lanier (2010), a computer scientist and early innovator in virtual reality, notes that the specific design of ICT, as conceived and implemented by technologists, imposes on us a particular way of viewing the world and our place in it, particularly our place in relation to ICT:

It is impossible to work with information technology without also engaging in social engineering....Technologists don't use persuasion to influence you....We make up extensions to your being, like remote eyes and ears (web-cams and mobile phones) and expanded memory (the world of details you can search for online). These become the structures by which you connect to the world and other people. These structures in turn can change how you conceive of yourself and the world....It takes only a tiny group of engineers to create technology that can shape the entire future of human experience with incredible speed. (pp. 4, 5-6).

ICT is thus the content of social expectations (that is, we need to have access to it and learn to use it) as well as the means by which other expectations—such as becoming a knowledge worker to support the national economy—are realized. It is in this context that we operate as adult education organizations, educators, and learners.

Technology in Adult Education: The Practice Context

One way to evaluate ICT-related changes in adult education is to consider categories of impact, for example to examine ICT's influence on our organizations, our work as educators, and on our students' learning activities. I'll first discuss each of these categories in reference to

ICT in adult education broadly, and then in relation to the special case of online education.

It's important to keep in mind that while the types of impact within each category are relatively clear, the extent and meaning of impact is much less clear. Technology integration and impact has been studied more closely in the K-12 and traditional higher education contexts; however, little research has been conducted to comprehensively assess the scope of ICT integration in adult education broadly.

Organization-level Impact of ICT

Any adult educator who is part of even a small organization has seen growth in the use of ICT to rationalize, standardize, and integrate administrative functions. Recruitment, enrollment, registration, scheduling, records, grades, budgets, procurement, security, library services, internal and external communications, and a host of other functions and services are handled by networks of hardware, software, and Internet "solutions." Such solutions range in size and complexity from relatively simple telephone and computer networks used in small adult education programs to incredibly complex systems used to manage the information functions of major universities. As these systems increased in comprehensiveness and technological complexity, a new term was developed to reflect the integration of multiple systems that embrace the entire academic enterprise: *enterprise resource planning* or ERP (Green, 2007).

For many educators, these are behind-the-scenes, administrative applications of ICT that have only an indirect impact on their work. For others, especially those in large institutions such as universities, "these new ERP resources and services are, by definition, open and interactive: students and faculty 'touch' them daily" (Green, 2007, para 7). The "touch," of course, can work both ways. While in some ways these systems provide support that we can access at need, in other cases they constrain us, forcing our work into a pattern dictated by the system, a phenomenon familiar to computer technologists called "lock-in" (Lanier, 2010).

Two other frequently implemented organization-wide applications of ICT are Course Management Systems (CMS) or Learning Management Systems (LMS) and plagiarism detection tools. A CMS provides online syllabi, grade books, activity tracking, and—depending on the system's complexity and the instructor's goals for its use—a variety of other resources such as practice tests, learning activities, and a means

for interaction among fellow students and/or with the instructor. Increasingly CMS are used in face-to-face courses to increase flexibility and ease of access to course materials. Plagiarism detection systems such as Turnitin have been widely adopted by institutions as a means to both discourage and detect violations of their academic integrity policy. To a large extent such systems have been designed and implemented in reaction to an organizational perception (based largely on inconclusive data) that the easy access to information offered by the World Wide Web has increased students' opportunities and tendency to plagiarize academic sources.

Impact of ICT on Adult Educators

The far-reaching influence of ICT on the day-to-day activities of adult educators is perhaps most obvious in our expanded access to information and resources that help us—or that we hope will help us—perform effectively in our roles as teachers and other academic staff. This impact has three dimensions: 1) as a technological way to access resources for teaching, 2) as a technological way to access resources specifically about how to use ICT in teaching, and 3) as a mode of instruction.

In the first case, ICT provides the conduit for accessing web sites and databases to retrieve information and resources: subject matter content, research reports, and strategies and techniques for teaching adults generally or for teaching specific populations of learners. It also offers the means for educators to network with each other, sharing ideas, resources, even policy advocacy via online discussion groups, wikis, blogs, and other social media. An example of this use of ICT is the National Coalition for Literacy Advocacy Clearinghouse and Toolkit blog (<http://blog.ncladvocacy.org/>). In the second case, ICT connects us to information specifically focused on using ICT to teach adults. An excellent example is the “Adult Ed Online” web site (<http://www.adultedonline.org/about.cfm>), an element of the Strengthening Programs through Technology project funded by the U.S. Department of Education. In the third case, ICT is a “toolbox” from which we select a technology or mix of technologies as the mode of instruction for at least a portion of classroom learning activities. Computers, productivity software, instructional software, assistive technologies, the Internet, and other virtual communication tools, when integrated thoughtfully and skillfully, have changed the way many adult educators attempt to enhance their teaching effectiveness and their students' achievement.

The scholarly work of adult educators has been influenced in similar ways. ICT provides the means to access a wealth of theoretical literature and research studies. Additionally, authors, researchers, reviewers, and presenters now routinely submit their publications, grant proposals, peer reviews, and conference presentations via the Internet to comprehensive scholarly workflow management systems such as ScholarOne™ (<http://scholarone.com/>). In the conduct of research, some scholars use ICT to facilitate the research process—particularly in collaborative projects involving researchers at multiple sites—while for others ICT has become the focus of their adult education research.

In many cases, technology-influenced changes in how we do our work have been positive: they have expanded or enhanced our ability to be effective educators. Other effects are more ambiguous, however. The ubiquitous availability of information challenges our ability first to filter it for quality, then to assimilate and apply it appropriately. Changing work patterns influenced—in some cases driven—by the technological means by which we now so often communicate have changed our interactions and relationships with colleagues in fundamental ways. While many of the superficial effects of ICT are relatively clear, longer-term effects are still to be discovered.

Impact of ICT on Adult Learners

Generalizing about the impact of technology on adult learners is difficult given the incredible variety reflected in the adult learner population. We know from national studies of technology use that ownership and use of ICT is positively correlated with educational and economic levels. Thus, to the extent that students in different practice contexts (ESL, ABE, labor education, adult higher education, continuing professional education, etc.) reflect differing educational levels, abilities, and/or economic profiles, we might expect differing types and levels of impact.

For some students, particularly those who routinely use ICT in their work and/or leisure time, the impact of technology on their learning may well be minimal, perhaps represented only by a few new, academically focused uses for already-familiar tools. For students with little or no prior experience with ITC, well-planned integration of appropriate technologies into teaching-learning activities can have a profound impact. Learning the technology—how to perform basic computer operations, use word processing software, send e-mail, etc.—develops basic skills that are increasingly necessary in many workplaces, and so contribute

to economic stability. Learning to use ICT as a tool for further learning through access to resources, collaboration with other learners, communication with the teacher, etc. can provide a basis for future self-management of learning for professional development or personal growth. For yet another population of learners, adults with disabilities, assistive technology can open up access to learning opportunities and make manipulation of educational materials more manageable.

The stress above on the well-planned and appropriate integration of technology emphasizes the point that the positive effects described above are possibilities; they do not result automatically from learners' use of ICT. ICT can support development of higher-order thinking and knowledge attainment (Sitzmann, Kraiger, Stewart, & Wisher, 2006). The extent to which it actually does so depends on a variety of factors, including adult educators' ability to avoid what critics have called "a commodified pedagogy of information delivery" (Hamilton & Feenberg, 2005, p. 103) via ICT.

An additional "open question" is the relationship between education and the workplace, a relationship brought ever closer by ICT. The very terms "knowledge economy" and "knowledge worker" reflect a melding of identities in what had in the past been relatively distinct realms. The long-term effect of such a melding is still unclear.

A Special Case: Online Adult Education

The most visible impact of ICT on our field is in the area of online education. Although online education has now expanded to include large numbers of K-12 and traditional-aged college students, initially it was an extension of early forms of adult distance education.

For years, adult distance education was a relatively minor, often marginalized activity carried on and promoted primarily by a small group of adult educators dedicated to broadening access to educational programming to un-served or underserved populations of adults. These educators used a variety of media and media combinations to offer programs to students who, because of barriers of distance or personal circumstances, were unable to participate in face-to-face educational programs. Within traditional educational organizations, serving non-traditional students was usually viewed as ancillary to the core institutional mission. The number of students served by distance education programs was usu-

ally small, and the organizational support was proportionally limited (Thompson & Irele, 2007).

But now, the situation has changed. As Archer and Garrison (2010, p. 322) note,

[W]ith the development of the World Wide Web in the mid to late 1990s, making the Internet much easier to use, this form of education suddenly expanded outside the traditional distance education community and became increasingly popular in the education community generally, both in the formal system at all levels and in the private sector.

Although from the beginning online education served students at all levels of the educational system, in the first decade of its appearance it was still very much an adult education phenomenon. For example, during the first five years following the launch of Penn State University's World Campus in 1998, over 90% of the students were over 25.

Corporate professional development programs were also early adopters of online delivery, serving large numbers of adults in the workplace, including in the military. In other areas of practice, expansion of programs into the online environment moved (and continues to move) considerably more slowly. Although currently it's possible to find examples of online programs in practice areas such as Adult Basic Education (ABE) and English as a Second Language (ESL), most of these are associated with large community college or university programs rather than smaller, community-based programs. It's interesting to note that in the two chapters in the most recent *Handbook of Adult and Continuing Education* that focus on these practice contexts, no mention is made of online programs for these learners, and only a brief mention is made of online professional development opportunities for instructors (Larrotta, 2010).

At this point the adult experience of formal online education takes place most often in the higher education and workplace contexts. Similarly, our knowledge of participation rates is also limited to studies done in these contexts (e.g., Allen & Seamans, 2010), with little information available on the extent of penetration into other practice areas.

Organization-level Impact of Online Education

The slow expansion of some programs into the online environment may be explained in part by the organizational changes necessary to sup-

port online programs. Perhaps the most obvious impact is in the costs associated with online education, particularly when it is implemented in addition to—rather than as a replacement for—face-to-face teaching and learning. To the start-up costs for the technical infrastructure necessary to deliver online learning programs must be added a number of other costs: the costs for ongoing technical support, for development of academic support systems (library, advising, etc.), for instructor and staff training in the use of technology to design and deliver instruction, and for provision of student services (or in some cases the costs of outsourcing aspects of this process).

Less tangible but arguably more fundamental is the impact on organizational culture. Implementing online education precipitates a number of organizational changes: changes in roles and responsibilities, changes in relationships with students and other stakeholders, and changes in institutional structures and operations. To a large extent these changes are reflected in and managed through changes to institutional policies that delineate roles, responsibilities, and standard operating procedures (Thompson, 2003).

Simonson and Bauck (2007) reinforce this point and identify seven necessary policy categories:

1. Academic policies
2. Fiscal, geographic, and governance policies
3. Teaching staff policies
4. Legal policies
5. Student policies
6. Technical policies
7. Philosophical policies

The extent of an organization's willingness and ability to work through the culture changes related to integration of online education will determine how much impact this innovation eventually has on organizational mission, structure, and operation.

Impact on Adult Educators

For many adult educators, the integration of online education into the field of adult education has been personally rewarding and satisfying. Thompson (2003), based on a review of the literature, identified specific benefits reported by faculty:

- Increased access by/to students
- Increased opportunities for high-quality interaction with students
- Flexibility and convenience of teaching
- Increased knowledge of and experience with ICT
- Opportunities for research and professional recognition related to online teaching
- Positive student outcomes

The above list reflects specific sources of satisfaction identified by faculty members who teach on line. However, these outcomes are neither automatic nor universal. Each element listed above depends in part on the existence of an institutional context that facilitates these benefits. Most of the necessary elements of such a context are reflected in the organizational policies listed in the previous section. To the extent that organizations address issues of infrastructure and technical support, participation in decision-making, training for teaching online, support for course development, appropriate compensation, and workload equity, the impact of integrating online education can be largely positive. Alternatively, in the absence of such support—and particularly when teachers have no choice in the decision to teach online or view online teaching as fundamentally changing their role as educators—the impact can be quite negative.

Another area of impact relates to adult educators' own learning. The rationale offered by Mathews-Aydinli and Taylor (2005) for the online professional development of ESL educators applies equally well to other adult educators:

Programs face a number of challenges in providing professional development for educators of adults learning English as a second language (ESL). Adult ESL teachers often work part time, may teach in more than one program, and often transfer from program to program. Facilities for providing professional development may be located far from one another within a state or region. In addition, teachers may have widely varying teaching experience, training, and qualifications. As a result, it can be difficult to:

- bring teachers together in one place and at one time for professional development events,

- group teachers appropriately according to their experience and needs, and
- sustain activity over time after an initial presentation or workshop.

Professional development provided online offers a way to address these challenges (para. 4).

Online education also offers opportunities beyond short-term professional development. For example, the Penn State Adult Education Program offers working adult educators the opportunity to gain a master's degree completely on line, regardless of their physical location. These practicing educators represent a wide variety of teaching contexts—from ABE to the military to workplace education—and live around the world. Although they welcome the opportunity to simultaneously fill a student role and a professional role, with the opportunity comes the challenge of one more responsibility to manage in already complex lives.

Impact on Adult Learners

What has been described above as the impact on adult educators as learners generally reflects the experience of other groups of adult learners, as well. These positive effects have received widespread and generally affirmative attention in the popular press, the academic literature, and government policy documents. In addition to the convenience of being able to exercise greater control over the time and place of study, online education enables learners to work toward improved employment prospects and future earning potential while retaining present earnings. It also offers a wide variety of educational opportunities for personal development.

Whereas early questions about distance education focused on its ability to support high-quality teaching and learning, much of that concern has been allayed as experience has demonstrated that well-designed and appropriately implemented online education can provide robust learning experiences. Receiving more attention now are concerns about the concept of access, with some scholars questioning an overly simplified concept of access that equates access for more people with equitable access (Herman & Mandell, 1999; Burnett, Senker, & Walker, 2009.). Focusing on the social justice goals of early adult distance educators, Archer and Garrison (2010) ask whether these educators' quest to serve marginalized students is being realized through online education or

whether it is “tending to turn at least the e-learning segment of distance education into just another option at the disposal of already privileged learners” (p. 325).

The Effects of ICT on Adult Education: Looking Backwards, Looking Forward

A number of models have been put forth for evaluating the relationship between technology and education. One I find particularly useful was suggested by a literacy practitioner when the “technology revolution” in education was really beginning to accelerate. In a 1998 reflective article, Bruce suggested a three-pronged approach for understanding the relationship of teachers and students to technology. He based his approach on linguist Michael Halliday’s three elements of language learning: learning language, learning through language, and learning about language (Halliday as cited in Bruce, 1998).

Following this model, we can evaluate the impact of ICT to date by considering how well we as a field have 1) learned ICT (what it is; how to operate it), 2) learned through ICT (used it as a tool to access and create knowledge), and 3) learned about ICT (understood its personal, professional, and social implications).

Learning ICT

Most measures of technology learning are indirect, that is, they measure access and use, rather than proficiency. Available data suggest that 85 percent of adults in the United States own a cell phone, and 76 percent own either a laptop or desktop computer. We also know that 79 percent of adults regularly use one or more of these technologies to access the Internet (Smith, 2010). While there is certainly a relationship among access, use, competence, and learning, the exact nature of that relationship is uncertain. Similarly, we lack comprehensive data on learning about technology specifically in adult education contexts.

However, the data we do have show a steadily increasing percentage of adults having access to and using various forms of ICT. Additionally, many individual adult education program descriptions attest to program elements with a specific focus on learning technology. Finally, position papers, strategic plans, government policy documents and a variety of other sources proclaim the importance of learning technology, thereby creating a context in which the goal is promoted and supported in a variety of ways. Thus, while the evidence certainly isn’t conclusive, it’s

strong enough to support an inference that increasing numbers of adult educators and adult students have learned and are learning technology.

Learning Through Technology

Here again, we lack the comprehensive data necessary to draw anything more than tentative conclusions. While we know that adults increasingly are using various forms of ICT, we don't have comparable evidence of the extent to which they are using it for formal educational purposes. In 2005, the last year in which questions related to education were asked on the Pew Internet & American Life Project survey, 57 percent of adult Internet users reported using the Internet to do research for school or training, 12 percent reported taking a class online for high-school or post-secondary credit, and 13 percent reported taking a class for personal enjoyment or enrichment. For that year, Internet usage by adults for all purposes was 68 percent (Madden, 2005). Given that the Project reports that as of May 2010, 79 percent of adults use the Internet via either computers or mobile technology (Smith, 2010), we might infer that educational uses of the Internet have increased as well. However, as Corbell and Valses-Corbell (2007) caution in relation to mobile technology, while it's clear that increasing numbers of students and teachers are using ICT devices, such use does not mean that students or instructors are necessarily using them effectively for learning and teaching.

Learning About Technology

When we ask, "Are those in the field of adult education learning to use technology and using technology to learn?" we can confidently answer in the affirmative. While we can't be certain about the extent (or quality) of such learning, we do know that it is happening. When we turn to our final assessment question—Are those in the field of adult education learning about technology?—the answer is less clear. While there are some positive signs, there are also obvious gaps, leaving us with insufficient evidence on which to base a confident claim that, as a field, we understand the personal, professional, and social implications of technology for adult education.

In this final section I'll discuss my impressions of our field's progress in understanding the implications of ICT integration into our field. I've based my thoughts here in part on a review of a selection of scholarly articles and conference presentation topics. This review of ICT topics presented at the Adult Education Research Conference (AERC) and addressed in articles in *Adult Education Quarterly* (*AEQ*) during the last

10 years is of necessity limited and impressionistic, since a complete research study would be necessary to comprehensively evaluate the scholarly work of the field over this period. However, even a limited review can offer insights into the extent to which a particular topic is viewed as important within the field and suggest what issues related to the topic have engaged our scholarly attention.

The review of AERC conference papers and *AEQ* articles found definite evidence of interest in the topic of ICT. AERC papers reflected interest in a variety of ICT applications in adult education, while all but one of the ICT-related main articles in *AEQ* focused on online education. Approximately half of all ICT-focused articles in *AEQ* were book reviews. Both venues offered articles and papers that went beyond reports of practice applications to thoughtful consideration of the implications of ICT use in adult education. In this respect they reflect a welcome difference from many publications coming from outside the field of adult education, in which ICT-based program descriptions and “best practice” articles tend to predominate. On the other hand, the relatively small number of journal articles and conference papers with an ICT focus suggest that coming to a deep understanding of the implications of ICT integration addressed throughout this article has not risen to “issue status” in the field. The topic has yet to attract the attention of many of our scholars, perhaps because it is still viewed as a “niche” issue.

Given the profound impact that technology has had and will continue to have on all aspects of our field, I believe that it’s time for study of its influence and effects to move beyond this niche status. So, I’ll end with some “forward-looking” reflections on three—among many possible—areas of inquiry (a.k.a. “Opportunities”) that I think could and should catch the interest of the field as a whole.

**Opportunity One:
Interrogating “Common Knowledge” about ICT users.**

Rapid adoption of new and largely unproven innovations raises significant concerns about impact that can be addressed only through research. However, institutional and program planning has in some cases been built on highly publicized “common knowledge” that has little or no basis in research. Two items of knowledge that are “common,” but also suspect, are the “digital native” and “digital immigrant” categorization of ICT users and the idea reflected in the statement that “Students will spend their adult lives in a multitasking, multifaceted, technology-

driven, diverse, vibrant world—and they must arrive equipped to do so” (Educational Testing Service, 2003, p. 3). Prensky based the first idea not on original research, but rather on several out-of-context sentences in a research report on childhood brain trauma (McKenzie, 2007). The usefulness of this distinction has been called into question by recent data on ICT use trends by age group (Madden, 2010; Jones & Fox, 2009). The second piece of common knowledge—that multi-tasking is an appropriate educational use of technological proficiency—has recently been questioned based on an extensive review of research on multi-tasking (Bannister & Remenyi, 2009). Investigation into both concepts could provide guidance for developing curricula that reflect the actual—rather than presumed—characteristics and needs of adult learners.

**Opportunity Two:
Exploring the Ethical Dimensions of ICT Integration.**

Building strong programs is a commonly stated organizational goal in adult education, with “strong” usually being equated with “fiscally sustainable” and “effective” (in the sense of positive learner outcomes). Often ICT has been adopted as an organizational strategy to facilitate this type of program strength, with too little attention given to the ethical elements that are also necessary factors in strong programs.

Within the broad field of adult education, discussions of the moral nature of teaching and learning have developed through decades of reflection on our field. Use of ICT for teaching and learning, however, is in many cases something other than a natural product of a self-reflective adult education enterprise. Rather, it has too often been the offspring of a marriage between technological advancement and institutional expediency. The result has sometimes been a standard of quality that combines a narrow conception of learning outcomes with fiscal viability. In combination these factors have led to a vacuum of research related to the ethics of technology integration that needs to be filled. Four aspects of the relationship between ICT and adult education with strong ethical dimensions deserve our research attention:

- Access
- Institutional, faculty, and student integrity in using technology
- Organizational change management
- Participatory technology assessment

**Opportunity Three:
Interdisciplinary Research on ICT in Adult Education.**

Disciplinary specialties relevant to learning about technology as it relates to adult education include technical domains such as computer science, technology, and artificial intelligence; design disciplines such as human-computer interaction (HCI); the learning sciences such as educational technology, psychology, and education; and the disciplines studying communication, communities, and discourse such as the social sciences and linguistics (Thompson, 2007). To date, however, there have been few efforts to pursue the multifaceted perspectives that can result from conducting research across disciplines.

**Conclusion:
Seizing the Opportunities**

Because of the profound influence of technology on all aspects of our work together, the general topic of “learning about technology” needs to engage the attention of more adult education scholars, practitioners, and students, particularly as the topic intersects with their particular research focus or practice context. Seizing the opportunities outlined above will deepen our understanding of the multi-dimensional impact of technology on adult education. Such an understanding is necessary to promote and develop adult education programs that are not just sustainable, but also sustaining, that is, that support and strengthen the learning projects of individuals, groups, and communities as a reflection of a just society.

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