

CHAPTER 6

Basic Skills in Adult Education and the Digital Divide

by

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INTRODUCTION

Traditionally, basic adult education has had a particular concern with the skills of literacy and numeracy, seeing these as essential for entry to the world of work. Adult education teachers may therefore be reluctant to adopt ICT, unsure of the part it should play, and worried about the time it takes away from the development of those basic skills. As we enter the 21st century, however, ICT has already become a necessary and important component of adult education. Formal and non-formal education are being delivered at a distance via technology – particularly the Internet – with the promise that learning can take place at any time and in any place.

Moreover, technology may provide the motivation that draws into adult education those who might otherwise not participate, and facilitate more meaningful learning for them. With all the talk about the *information*

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superhighway, many people feel the need for *driving lessons* so as not to get left by the roadside. Whereas those who lack reading, writing and mathematical skills are likely to be embarrassed by their inability, the same appears not to be as true for those who have yet to master technology skills. It is the ability to use ICT that is now seen as integral to obtaining and keeping jobs in almost every sector of industrialised economies. One has only to think, for instance, of the procedures for entering data in a business, hospital or restaurant, producing a shipping inventory in a factory or delivering a package.

According to the U.S. Department of Commerce (NTIA, 1999), disparities in access to ICT in America are significantly related to race, income and education demographics. For example, Black and Hispanic households are less than half as likely as white households to have Internet access. Families with an income over \$75 000 are more than 4 times as likely to have a computer at home – and more than 6 times as likely to have home Internet access – as those with an income under \$20 000 (over 20 million U.S. households). Also, households with higher levels of education among adults are far more likely to own computers and have Internet access than those at the lowest education levels, as the table indicates:

Household level of education among adults	Households possessing personal computers, %
No more than elementary education	8
Some high school education	16
High school diploma or equivalent	31

How many individuals in the United States and in other industrialised OECD countries have these levels of education? The U.S. National Adult Literacy Survey (Kirsch *et al.*, 1993) estimated that 40 to 44 million adult Americans, which is nearly 25% of the working population, have literacy scores in the lowest proficiency level. Similar findings have been reported in other OECD countries (OECD/Statistics Canada, 1995, 1997). About 45 million American adults do not have a high school diploma or General Education Development (GED) equivalent certificate (GEDTS, 1998), yet only 4 million of them participate annually in programmes to improve their basic reading skills and further their educational prospects.

Adults in the United States with low literacy – and in other OECD countries and many developing countries – are heterogeneous demographically, with large variations in ethnicity and language background, such as immigrants (Wagner *et al.*, 1999). Increasing numbers of studies in industrialised countries show that bio-behavioural factors, such as dyslexia, poor eyesight and learning disabilities, may affect literacy acquisition (Wagner and Venezky, 1999). Such individuals, like most adults, may have complex family, work, and social circumstances that cannot easily be put aside to permit education to take place, so adult literacy programmes typically have high drop-in and drop-out rates. These factors add additional complexity to issues of instruction methods, learning strategies, and programme planning and management.

In this chapter we suggest that the digital divide among adults within and across many nations is likely to persist for some years, the adults concerned being probably more resistant to change than children and youth, who will be growing up within societies ever more permeated by new technologies. Furthermore, up to the present the vast majority of ICT investment in education worldwide has gone into statutory schools and higher education, without regard for the educational needs of disadvantaged adults. There are extraordinary opportunities for ICT to bring about significant change for adult populations with low literacy, especially since adult education is less hampered by rigid education systems, required curricula, and constraints on individual motivation. The greater the divide or gap, the more dramatic the leap can be. In non-formal adult education, these leaps are only now beginning. Most of the examples in this chapter are drawn from the United States, where the focus on new ICT for adults is relatively advanced.

TECHNOLOGY SKILLS AND ADULT LEARNING

Whether in Tucson, Turin or Timbuktu, adults come to non-formal adult education programmes with a diverse range of needs and interests, along with a considerable array of skills, dispositions and experiences. The programmes are normally voluntary in nature, with individuals deciding whether to attend and how often. Participation may meet a workplace requirement, reflect an interest in learning skills not previously acquired, or be motivated by wanting to be able to support their own children's education. The key questions for ICT are its role in encouraging participation, and how it can help adult learners achieve their goals.

It is important to understand that definitions of literacy and basic skills needs are changing rapidly in most countries (Tuijnman *et al.*, 1997). Sufficient reading and mathematical skills are no longer enough; *technological literacy* (the ability to utilise ICT effectively) is becoming an additional educational necessity. Entry to further education or training courses may assume the skills, preparation, levels of commitment, and experience normally acquired by the end of secondary school. Increasingly for school leavers these skills will include familiarity and competence with ICT. It follows that mature adults who completed their studies before the advent of educational ICT will find themselves at a major disadvantage, when seeking entry to such courses. Let us look briefly at several domains where adult life intersects with technology and education.

The world of work

In the early 1990s, the U.S. Department of Labor set out to define general workplace skills that American workers need for a growing and changing economy (SCANS, 1991). Although different professions require different specific skills, most demand a set of basic competencies. Researchers set out to identify these foundational requirements, by interviewing employers, trainers and workers from several industries. Technology was identified separately within the enquiry, but technological competency was found to have permeated all skill areas, including the management of resources, communication with colleagues, and the acquisition and use of information.

An additional consideration for success in a quickly-changing work environment is the ability to continuously upgrade and master new skills, whether in response to shifting workplace priorities, obsolescence of job functions, or the implementation of new technologies. Since ICT is frequently at the centre of such changes, those who lack technological literacy skills find their options and opportunities to be restricted (Ginsburg and Elmore, 1998). In addition, the workers able to use today's technologies are the ones best equipped to learn the technologies of tomorrow.

Home and family

Many adults are motivated to return to education as they realise their limitations in regard to helping their children with school work. Schools are increasingly using ICT, thereby leaving parents who are unfamiliar with technology less able to support their children's education than they would have been a generation earlier. In addition, parents may need to negotiate on behalf

of their children, for instance over testing and placement for learning disabilities or exceptional abilities, and in the United States will find that parental information, support groups, and even legal advice, are available via the Internet. There is a gap in awareness of, and access to, these information resources.

Technological change is affecting what it means to function successfully in everyday life. The increasing automation in financial activities is having a major impact on how the average American household manages its fiscal affairs, from paying bills to investing in the stock market. Making decisions about medical treatment can be informed by perusing the extensive medical research and support networks available on the Internet, and encounters with the medical system are increasingly automated – both in record keeping and in medical care. Already many millions of citizens are using the Internet in this fashion.

Technology's potential impact on adult education

Those who dropped out of school often come to adult education with a history of frustrating and negative educational experiences, with expectations of failure and fears that structured adult learning will mean more of the same. They may describe earlier schooling as boring, rigid, alienating and insensitive. Many teachers in the adult education service might be sympathetic, but their curriculum and classroom styles have too often been those remembered from earlier schooldays. In one of the most dramatic pedagogical changes of the past decade, teachers can now use technology to create classroom experiences that more readily reflect present-day realities. Learners can develop the literacy, numeracy, problem solving, and technology skills that are actually used in every day life. For many this kind of instruction is empowering rather than frustrating, engaging rather than boring, and more obviously useful, especially in terms of job outcomes.

In addition, by employing ICT, teachers can individualise instruction. Until quite recently, the only resources available to most adult literacy courses were sets of workbooks, often a small library of books for learners to read, and perhaps newspapers, magazines, dictionaries and other reference books. Some teachers brought in additional resources for particular activities aimed at engaging learners. Now, however, computers with Internet connections can provide access in the classroom to a seemingly limitless repository of information, ideas and resources, as well as opportunities to communicate with people all over the world. Learners can themselves participate in the design of learning activities to accommodate areas of personal interest. Interactive software is becoming available in an

increasing number of languages, and immigrants are able to find out what is happening in their home countries.

The integration of technology into adult education also changes the classroom culture. Some teachers and learners find the changes in the roles and relative power dynamics of the teacher and learners exciting, while others see them to be disconcerting and confusing. Learners have access to a greater variety and depth of information independent of the teacher, who no longer has to specify all classroom activities, but may become a facilitator who questions, encourages, helps, and challenges. Learners take more control and responsibility for their own learning. As yet, however, only small number of programmes in a few countries are actively implementing this model of adult learning. Neither in the United States, nor in other industrialised or developing countries, can we say that technology-based adult education has yet become the *modus operandi*, but we can suggest this is the direction for the future.

KEY FACTORS IN THE DEVELOPMENT OF ICT-BASED ADULT EDUCATION

In the United States and other industrialised countries, the average per capita annual expenditure on adult education is less than 10% of that spent on formal schooling for children, and in developing countries (where the needs are even greater) the percentage drops to as little as one per cent (Wagner, 1995). Adult literacy programmes have poorer Internet access than public schools (NCES, 1999):

	U.S. adult literacy programmes	U.S. public schools
Internet access	50	89
Classrooms connected	40	51

Moreover, only about half of these programmes with Internet access had high-capacity lines, which puts adult education at the *have-not* end of the digital spectrum.

Facilities and access

One way to conceptualise the challenges of the digital divide for adult learning is to look at the issue of access to facilities and infrastructure. In the United States, many states hold adult classes in school or community college facilities,

which largely reduces the access problem to that of competing for available time. Since many adult education classes are held during evenings, weekends, and other non-schooling periods, significant access is possible. Another strategy often chosen by large volunteer tutoring programmes, is to use community centres such as public libraries or job centres as the centre for ICT. Those individuals who are least likely to have Internet access at home or work (earning less than \$20 000 per year, minority groups, and those without a college degree), rely most on ICT resources in public facilities (NTIA, 1999). The promotion of community learning centres may also be seen in Europe, Asia and Africa (for one interesting example in Ghana, see Fontaine and Foote, 1999).

Home access to the Internet has become more and more popular, even in relatively poor communities in industrialised countries, though less so in developing countries. In the United States, learning at home with public broadcasting of learning materials has helped over a million adults to obtain the General Education Development (GED) equivalent of the secondary school qualification. Other broadcasts – such as *Crossroads Café* – have targeted basic skills and English as a Second Language. These television programmes, viewed live or on video, are important for populations unable to attend adult education classes. Home learning resources and programmes are now beginning to move towards multi-media and web-based delivery, as described further below.

Teaching and learning

In order to promote ICT-based learning, it is necessary to demonstrate the availability of high quality, cost-effective technology-based curricula, and to prepare teachers to use these materials, through an affordable professional development programme. Several recent large-scale initiatives have begun developing multimedia curricula and instructional materials geared to the needs of adult learners, including the federally-funded *LiteracyLink* and *CLASS* projects described below. These resources and curricula can be used as a comprehensive programme or can be integrated with other instructional materials and activities.

Adult educators frequently feel unprepared to use technology, being unable to fall back on well-developed models from their own learning experiences. They have few informal opportunities to learn from each other or to share teaching resources. Many of them – only now becoming technologically literate – are just beginning to explore the myriad of Internet sites that contain lesson plans and technology-rich instructional activities. They face the problems of how to manage classroom activities with only one computer, or to be sure that learners are

progressing in reading, writing, and mathematics if they are using the Internet. Where can they get ideas for instructional activities that work for adult learners? How can they deal with learners who are at different levels of literacy, and what happens when they are asked questions that they cannot answer? It is important to address these issues. High quality professional development opportunities are needed for adult education teachers to become confident and competent users of ICT.

PROGRAMMES THAT BRIDGE THE DIGITAL DIVIDE

Access to ICT-based learning at home

In the United States, two promising programmes are aimed at helping traditionally under-served families to gain home-based access to ICT and opportunities to learn. One, LINCT,¹⁹ seeks to help communities achieve electronic equity through a locally-managed learn-and-earn process. The communities co-operate with corporations, to generate a sustainable supply of donated, recyclable technology, and to provide ICT trainers. In South Phoenix, Arizona, low-income families can “buy” their own home computer, following 100 hours of service on the programme as a tutor, a tutee or a tutor supervisor. LINCT provides training and has reported evidence of participants developing literacy and numeracy skills. The *Time Dollars* earned from this participation may be used to “purchase” a refurbished computer and subsequently computer up-grades, modems and peripheral up-grades. Exceptional participants, provided with 300 hours of technology training over 12 weeks, become paid employees of the programme.²⁰

A second programme is *Neighborhood Networks*, that offers access to advanced technology, with training and support, to help residents increase their earning power and move off welfare and other public subsidies. Seed capital is provided to establish computer centres in privately-owned apartment buildings. The centres are sustained financially by contributions from local partners in each community and by income generated from the centres’ own business initiatives. They offer welfare-to-work initiatives, classes in General Education Development (GED) high-school equivalent qualifications, basic computer-literacy training, resume

19. The LINCT Coalition, Learning and Information Networking for Community – via Telecomputing.

20. See <http://www.linct.org>.

writing, with use of computers in a home-based environment that is convenient for families. Parents can acquire skills that increase their employment marketability, while children can use the technology for school projects (Neighborhood Networks, 1998).

Support for adult educators

Two resources, *LitTeacher*²¹ and *Captured Wisdom*,²² are newly available to help adult literacy teachers develop their own technology skills and methodology for integrating ICT into learning programmes. *LitTeacher* is a virtual resource centre, which includes training in technology issues, technology assistance, a menu of materials on literacy education, a wide assortment of existing literacy resources and professional development video conferences. The virtual centre assists literacy teachers and service providers in making effective use of curriculum materials, and enables the development of electronic communities of teachers for mutual support and learning.

Captured Wisdom is an interactive resource designed to allow adult educators to visit colleagues' classrooms virtually, to see successful practices of integrating technology into adult education. Disseminated in videotape and CD-ROM formats to adult literacy programmes across the United States, *Captured Wisdom* provides the adult educational community with inspiration into what ICT can accomplish. Experienced teachers and learners were filmed using technology in classroom-based, replicable projects that support learning in traditional and new content areas. The videotaped segments were viewed by focus groups of teachers who generated questions about the practices and techniques described. These questions were grouped into categories such as *Classroom Management*, *Assessment*, *Technical Issues*, and were posed to the presenting teacher, whose responses were recorded and included. The classroom-based projects serve as springboards for discussions about how such projects and teaching techniques can be adapted to suit individual teaching styles, learners' needs and local education contexts.

21. *LitTeacher* is a component of the *LiteracyLink* Project [a US Department of Education funded partnership of the Public Broadcasting Service, Kentucky Educational Television, National Center on Adult Literacy (NCAL) at the University of Pennsylvania, and the Kentucky Department of Education].

22. *Captured Wisdom*, developed by the federally-funded North Central Regional Technology in Education Consortium for K-12 teachers, was extended to adult literacy educators by the National Center on Adult Literacy (NCAL).

Helping adult learners prepare for the 21st century workplace

Two other American programmes are helping adult learners to work with the technology that is used in the workplace. The Central Illinois Adult Education Service Center (<http://www.cait.org/ciaesc>) has developed an intensive 60-hour pilot programme during which adults who have been on public assistance prepare themselves to enter the workforce. Each learner creates an electronic portfolio, that includes examples of work prepared with the various software application packages used in most businesses. In addition, learners create an electronic “All about me” presentation, employing software that can be used to demonstrate their capabilities during a job interview. The ICT skills acquired are not insignificant, but of even more note is the new air of confidence instilled, as participants realise they are learning what many better educated adults have not yet begun to master.

Rend Lake College (<http://www.rlc.cc.il.us/Skills>) adult education teachers have created project-based learning materials for their GED secondary equivalent qualification. Packets have been prepared filled with the minutiae of an imaginary work environment, including biographies and timesheets of individual employees, complaints from unsatisfied customers, orders and financial information. Learners are charged with acting as consultants, to make recommendations to save the business. They may use technology as they think appropriate, whether to write letters, prepare budgets with spreadsheets, or find marketing information on the Internet. This enables them to acquire meaningful workplace skills, while at the same time developing the reading, writing and numeracy skills that they need to complete their high school equivalent certificate.

Opportunities for independent learning

The CLASS project²³ (http://class.unl.edu/final_web/index.html) aims to develop and operate a system that provides on-line, nationwide access to educational and curriculum resources, including the support services necessary for students to acquire a fully accredited high school diploma. When completed in 2001, CLASS will have 54 accredited courses available to students. The scheme provides an alternative to traditional class work, tailored to those students who may need special consideration from the non-traditional, geographically

23. The CLASS Project (Communications, Learning, and Assessment in a Student-centred System) is a partnership of the Independent Study High School at the University of Nebraska-Lincoln, and the Nebraska Department of Education.

isolated or disadvantaged segments of the population, including the gifted as well as at-risk learners. It offers an alternative to learners who did not complete high school, regardless of their age or situation, and supplements the work and course selection of any student wishing to pursue topics that are not available in their current learning setting. Availability extends widely, for instance to those who work during the day, those who are home-bound for a variety of reasons, or those serving time in prison. Students can work on the programme whenever they wish, and devote to it as much time as they need.

The *LiteracyLink* initiative (<http://www.pbs.org/literacy>) is also designed to use print resources, ICT and the Internet, to help adults receive literacy instruction and gain a high school diploma or GED equivalent. It includes the production and distribution of new video materials, that can be delivered by broadcast television or video tape. There are 26 video programmes for *Workplace Essential Skills* (WES), addressing basic skills in a workplace context – reading, writing, communication and mathematics. WES also addresses issues of job searching, career planning, and workplace culture orientation. The videos are complemented by on-line and printed material. *LitLearner* on-line integrates the video and other Internet resources in easy-to-use electronic formats, with icon-driven menus.

Another component, *LitHelper*, will help students and teachers to tailor the video, print, and on-line instructional materials to specific students or to local literacy programmes. It includes both assessment and management functions to help the learner and teacher manage their learning. Special website “tours” are used to introduce learners to the on-line system. *LitHelper* will also provide personal appraisals to give a better sense of the most appropriate activities to match the learners’ specific needs. All learner on-line interactions are collected in a personal *HomeSpace*, that includes portfolio functions for on-going assessment of progress and periodic revisions of the learning plan.

ADULT LEARNING AND ICT IN RICH AND POOR COUNTRIES

We noted earlier that, to varying degrees, improved literacy and basic skills are a recognised need in all countries, rich and poor. In all countries economic growth and civic participation depend increasingly on an educated community. In this chapter, we have focused primarily on ICT and adult learning in the United States, as that is the locus of some of the most innovative projects to date. While many countries around the world are beginning to invest significantly in ICT for school-aged populations, relatively little as yet has been undertaken for

disadvantaged adults (in contrast with adults learning in the university). Given the chronic under-funding of adult education in general, it may be no surprise that ICT investment has been thought too expensive, especially in developing countries. However, unless adult education is equipped to take advantage of the tremendous potential of network technologies and distance education, the gap between the information-rich and the information-poor will continue to grow.

We know that the penetration of the Internet is increasing across the different socio-economic groups in industrialised countries. It is extending also across poorer developing countries – though often superficially as yet – as evidenced by *Internet cafés* sprouting up in the street in such countries around the globe. One can get connected from nearly any urban or semi-urban location worldwide. The impact of such access for adult education in developing countries is not yet known, as many of these countries lack the resources for adult literacy programmes and campaigns.

Effective development in adult education – as in other educational sectors – requires of necessity a primary focus on improving the professional development of teachers and the utilisation of distance-education methods. Teachers are the main, but also the most expensive resource of education worldwide. To an extent, attention to this professional development has begun in the formal schooling sector, but relatively little has been done in adult education. However, the International Literacy Institute (UNESCO-affiliated) at the University of Pennsylvania has now completed a prototype of *International Literacy Explorer*, a teacher-training multimedia tool for basic educators (Wagner, 2000). In a public/private partnership called *Bridges to the Future*, ILI and NCAL are working to adapt such multi-media tools for the professional development of adult educators in a number of developing countries (see ILI/NCAL website: www.literacy.org).

CONCLUSION

It is not unreasonable to expect that in only a few years, ICT (especially personal computers and the Internet) will have reached a saturation level among the United States population similar to that of telephones and television. Computers will be found in homes and in public access sites across the country. Perhaps a system of universal service for homes will be put into place, in the way that the federal e-rate programme provides subsidies to impoverished schools to help them get to the technology levels of wealthier schools. Even if everyone had such access to ICT, important questions would remain.

Will adults (in addition to school children and youth) take advantage of the learning opportunities available through ICT, or as with television, will entertainment and shopping win out over learning? Thus far, the use of ICT relies heavily on written communication. Will those who have limited literacy skills be left behind even when ICT is easily accessible, because they cannot read and write well enough to benefit from it?

We know that only a small percentage of those who could benefit actually enter adult education programmes, and many do not participate for long enough for any meaningful impact. Improving the ways technology is utilised as a learning tool can make adult education more engaging and more effective. Already ICT is providing additional opportunities to learn in less structured environments, such as independently at home or at libraries. It remains to be seen if the numbers opting for such alternative educational routes will increase, as the technology becomes more available and more user friendly.

As we have noted, ICT-based education seems to be ideal for giving additional educational opportunities to at-risk and disadvantaged adult learners, but research is urgently needed to identify best approaches for helping them to succeed in these new learning environments.