

THE POWER OF
TECHNOLOGY
TO TRANSFORM
ADULT LEARNING

Expanding Access to Adult Education
& Workforce Skills Through
Distance Learning

by Mary L. McCain

October 21, 2009



Council for Advancement of Adult Literacy

**1221 Avenue of the Americas - 46th Floor
New York, N.Y. 10020
<http://www.caalusa.org>**

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[Eds. Gail Spangenberg and Bess Heitner]
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FOREWORD

In early 2009, the Council for Advancement of Adult Literacy (CAAL) launched a project to further develop the technology recommendations proposed by the National Commission on Adult Literacy in *Reach Higher, America*. *THE POWER OF TECHNOLOGY TO TRANSFORM ADULT LEARNING: Expanding Access to Adult Education & Workforce Skills Through Distance Learning* is the result of that effort.

Federal and state government is the primary audience for *THE POWER OF TECHNOLOGY*, but CAAL also aims to guide private sector engagement and assist program and curriculum development by adult education and workforce skills providers at the national, state, and local levels. To these ends, *THE POWER OF TECHNOLOGY* offers a primer on the tools of technology, reviews the findings of recent research on distance learning, and presents a wide range of other information and analysis. It also recommends federal and state action in five major areas, all directed at scaling up to more effectively meet national need. The recommendations are realistic and attainable.

The views in *THE POWER OF TECHNOLOGY* are solely those of CAAL and study director Mary McCain (see Appendix A). Dr. McCain is Senior Vice President of TechVision21. She brought extensive knowledge, insight, and an open mind to the task and CAAL is deeply grateful for her enormous contribution to advancing the Commission's vision. We are also grateful to our outstanding team of professional advisors, especially those who gave their wisdom and experience as members of our core working group (see Appendix B). We also want to recognize the many other researchers and practitioners who have carried out important developmental and research work in the areas treated by *THE POWER OF TECHNOLOGY* over the years. If funding support becomes available along the lines recommended, many of them are poised to do even more. Their work is evident throughout this paper.

We also want to thank our organizational and individual donors, including the Dollar General Corporation (the major funder of the National Commission), the Joyce Foundation, the Wal-Mart Foundation, the Charles Stewart Mott Foundation, and The McGraw-Hill Companies. We extend special thanks to Harold W. McGraw, Jr., who has persisted for more than 20 years in his financial and personal support of adult education. He helped fund the National Commission and remains a major supporter of CAAL's work. The steadfast commitment and generosity of all of these leaders has made this project possible.

Gail Spangenberg
President, CAAL

EXECUTIVE SUMMARY

There is a highly compelling case for using technology on a large scale to increase access to and improve America's adult education and workforce skills enterprise. Many of the reports that have examined adult workforce development in the past few years have reached this same conclusion, including *Reach Higher, America** (June 2008) from the National Commission on Adult Literacy.

By the reckoning of the Commission and others, the nation must reach many more millions of adults with effective college- and job-readiness skills programs in the next decade and beyond. We risk losing our nation's economic viability, standard of living, and core democratic principles if we do not. But we cannot bring about needed reform without deploying technology on an unprecedented scale. As *THE POWER OF TECHNOLOGY TO TRANSFORM ADULT LEARNING* makes clear, this means the extensive use of distance learning and all of the tools in our distance learning arsenal.

Fortunately, we do not need to start from scratch with programs and materials. All kinds of content is available as a foundation on which to build and a wide variety of existing and emerging technology (detailed in Appendices D and E) can be pressed into service.

As we get started, a few fundamental facts must be recognized:

- Some college education or job training is required for the majority of jobs now and in the future. Yet, nearly half of all American adults, including those in the workplace, need some level of skills upgrading to get into college or job training or to advance in jobs (88 million to 90 million individuals aged 16 and older).
- Information and communications technology skills (ICT literacy) are essential, both on and off the job and there is considerable work to be done on this front. Some 70 percent of all jobs in the U.S. will require some level of ICT skills by 2016).
- Many good technology-based programs exist – for skills upgrading, professional development, and program management purposes – but access to information about them is limited. Not enough people know about either the tools available or the programs and content designed for them.
- Existing programs need rigorous evaluation to assure high quality and relevance for diverse learner needs in self-study environments, and, additionally, new programs of consistently high quality and relevancy need to be developed.
- Planning for technology use needs to be set into comprehensive statewide adult education and workforce skills development plans.

* Go to <http://www.nationalcommissiononadulthoodliteracy.org>.

- Learners at even the lowest levels of literacy and language proficiency can engage with online learning content. Reports indicate that they are eager to do so and that they benefit in important ways, e.g., self-confidence, self-directedness, and independence. Adults across the literacy and language spectrum show strong motivation to gain computer literacy skills, perceived as key to work advancement. In fact, time spent in employment and exposure to ICT substantially enhance literacy proficiency generally.
- Technology plays a prominent and increasing role in everyday life and at work. Access to it and connectivity to the Internet are growing rapidly, even among low-skilled adults. (Despite the higher costs of broadband, 63 percent of all Americans have broadband connectivity at home, some 77 percent of adults have a computer, and 84 percent have a cell phone.) However, although access is growing among all categories of users, the digital divide remains problematic for certain categories of potential learners, especially those at the lowest skills levels and most in need of services.
- Whether an adult has no experience using computers or the Internet or is well-versed in ICT skills, technology offers an entirely new environment and learning experience that adds to or can go beyond the traditional classroom experience of instructor-led text-based formats. Research shows that self-study through distance learning – where materials are delivered through a variety of media – holds high promise in terms of learning gains, and persistence and motivation are markedly better than in traditional classroom-only settings, even for low-skilled learners.

FIVE NEXT-STEP RECOMMENDATIONS

- A. Establishing a National Web Portal.** As a top priority, the federal government should establish a national web portal. Information about technology-based program options must be made available nationally, on a comprehensive and credible basis to both adult learners and program professionals, in order to significantly expand access to learning. The portal should be designed to serve effectively the uniquely different learning needs and goals of the two different user groups. Special considerations are needed to ensure navigation ease and appeal to adult learners, including low-literacy adults with limited ICT skills. Sustained dissemination and effective promotion will be necessary to ensure that information reaches the target audiences effectively. This portal should be the responsibility of either the National Institute for Literacy or other authorized federal agency. The specific technical requirements for the portal should be determined by a broadly representative Advisory Board.
- B. Encouraging State Leadership.** The federal government should launch a grant program to help states integrate technology-assisted learning systems and/or programs into their overall adult education and workforce skills planning. Self-study activities must be grounded in particular state and regional service programs where learning gains can be formally verified, and where communities of need can be reached through targeted awareness and

outreach campaigns. State planning and leadership must go hand in hand with federal leadership, although states must see adult education as their own issue.

- C. **Supporting the Development of Distance Learning Programs.** Projects should be undertaken by federal and state government that focus on distance learning certifications, performance measures that certify ICT literacy, online assessment of learning, testing and adaptation of new forms of technology-based learning, aligning units of successful learning with community college credits, and other areas of developmental need.

- D. **Meeting the Research Need.** The federal government should support a sustained, serious, and well-funded research, analysis, and evaluation effort – to support and inform the use of technology and distance learning for adult education and workforce skills purposes, and to enrich the national web portal on an ongoing basis. For example, we need better baseline data on adult learners and computer use, and we need evaluation of self-study learning as it relates to specific education outcomes (getting a GED, gaining English proficiency, demonstrating readiness for jobs and college). We need to know about the kinds of technology-assisted learning adults actually find and use, why and how they use it, and whether it is effective in achieving the outcomes they sought, and if so, why. We need to know much more about the conditions under which successful Internet-based interactive learning takes place.

- E. **Fostering Stakeholder Involvement.** Federal and state government should provide incentives for involving a full range of nongovernmental stakeholder groups. They should undertake specific projects to encourage collaboration among all sorts of groups at all levels – including adult educators and workforce skills experts, planning agencies, businesses, unions, youth policy organizations, family literacy groups, correctional institutions, school districts, community colleges, health care entities, and others. The National Institute for Literacy or other appropriate entity should establish a state advisory committee specifically representing these groups. Corporate and philanthropic sources have a special role to play and are natural partners in developing the recommended national web portal. They should be called upon to contribute equipment, grants, employee time, and technical assistance.

CONCLUDING NOTE

It is not practical or desirable to abandon our current service system, nor is it viable to simply continue tweaking it. We have the means and know-how for a substantial redirection of the national adult education and workforce skills effort with technology as our ally. We need wholesale change; the wider and wiser use of technology can help bring it about.

THE POWER OF TECHNOLOGY TO TRANSFORM ADULT LEARNING

Expanding Access to Adult Education & Workforce Skills Through Distance Learning

The challenge is clear; the country must successfully reengage adults who have too little education (knowledge and skills) to hold living wage jobs. Failure to do so puts the nation at competitive risk. Rising to the challenge will require developing new strategies and new tools. The old ones have proven to be insufficient to the task. [NCHEMS]¹

INTRODUCTION

In *Reach Higher, America* (June 2008), the National Commission on Adult Literacy found that about half all American adults lack the basic and soft* skills needed to get and advance in 21st century jobs that pay a family-sustaining wage. It called for transforming the current fragmented services offered by adult basic education and workforce skills development groups into a coherent integrated system with outcomes to meet 21st century needs. At stake, the Commission emphasized, is nothing less than America's ability to compete globally, remain nationally secure, and retain its core democratic principles.

The Commission took as its focus the 88 million adults, aged 16 and above, who have at least one major educational barrier to acquiring job access and admission to postsecondary education² – high school dropouts, adults with high school diplomas who are not college- or job-ready, and adults in need of English language services. The report emphasized that about half of the workforce is deficient in the essential basic and soft skills, and that some two-thirds of the workforce is beyond the reach of K-12 schools.

Adults who need basic and workplace skills, including English language services, must rely on the existing “system” that provides this education. Yet not only is this system fragmented and siloed, but it is equipped to serve only a small percentage of those in need.³

The Commission called on Congress to create an adult education and workforce skills system with the capacity to effectively serve at least 20 million adults annually by the year 2020, up from the 3 million currently being served by the major federal programs. It recognized that this goal could not be accomplished without heavy and innovative use of technology – to expand services to adults through distance learning and self-study, and to provide cost efficient approaches to program and data management.⁴ Indeed, one of the Commission's nine key recommendations was to deploy technology on an unprecedented scale.

* The basic skills, as defined by the Commission, are reading, writing, math, and English language proficiency. Soft skills are the ability to communicate, acquire information, think critically, solve problems, use technology, and work in teams.

The Commission stated that: *“Technology should be used in all its forms to make learning a continuous process of inquiry and improvement that keeps pace with the speed of change in business and society.”*

I. THE CONTEXT FOR TECHNOLOGY DEPLOYMENT

Technology is no panacea for solving the nation’s adult education and workforce skills problems, but the Commission, some leaders in Congress, and many others have recently recognized that it must be a central component of any serious national effort to improve and expand service on the scale needed. For one thing, the adult education and workforce skills system the Commission calls for cannot accommodate more than a fraction of adults in need without the help of technology. For another, we now live in a world that functions increasingly in a technology-encompassed mode, and learning and work are less and less accessible to those who cannot use technology.

Strong technology skills are essential for adults seeking to improve their knowledge, skills, and English ability, and this is the case whether the goal is to attain a GED or to enroll in further education or job training.

Fortunately, we do not need to start from scratch in putting technology to wider use. Many good GED, postsecondary, and job-related education programs are already available via distance learning and they provide a foundation on which to build. Furthermore, information about programs, courses, and certification is increasingly available online, and indeed online-only applications for education or jobs are becoming more common. Evaluating, adapting, and developing the models we already have (see Appendix E, p. 52 for some examples) can provide the flexibility and options for self-paced learning that adults frequently require on their paths to higher education and employability. Moreover, the Obama Administration recently launched the “American Graduation Initiative,” which provides for developing 1,000 free online courses, available nationwide through community colleges and articulated to degree requirements.⁵

But taking advantage of current and developing opportunities in an information society requires that individuals and program managers have ICT literacy (information and communications technology skills). It also requires that we all understand what the “tools of technology” are and what they are good for, and that we learn from and build on what we already know.

A. What Is ICT Literacy?

The basic elements of ICT literacy – sometimes called “information literacy,” or “digital literacy” – are generally defined as follows:

- **Access** – Knowing about and knowing how to collect and/or retrieve information. Searching, finding/locating, and retrieving information in digital environments.

- **Manage** – Applying an existing organizational or classification scheme. Conducting a rudimentary and preliminary organization of accessed information for retrieval and future application.
- **Integrate** – Interpreting and representing information (summarizing, comparing, and contrasting) material from multiple sources by using ICT tools.
- **Evaluate** – Making judgments about the quality, relevance, usefulness, or efficiency of information. Judging the currency, appropriateness, and adequacy of information and information sources for a specific purpose (including determining authority, bias, and timelines of materials).
- **Create** – Generating information by adapting, applying, designing, inventing, or authoring information in ICT environments to describe an event, express an opinion, or support a basic argument, viewpoint, or position.
- **Communicate** – Communicating information persuasively to meet needs of various audiences through use of an appropriate medium. Communicating, adapting, and presenting information properly in its context (audience, media) in ICT environments and for a peer audience.

Jobs at all levels now demand that employees not only have a high school diploma but also, at least minimally, the ability to use information and communications technologies. As technology has become more pervasive in every workplace, workers must be able to communicate and collaborate using computers, mobile devices, the Internet, and other technology tools, as well as the practices associated with their use. Delivery drivers and service technicians must be able to communicate with supervisors or colleagues at a distance. Jobs in the hospitality and retail industries require the ability to record and track information electronically. And employees increasingly can and must access on-the-job training via computers and the Internet.

According to Bureau of Labor Statistics projections, more than 70 percent of all jobs in the United States will require some level of ICT skills by 2016.⁶ Numerous studies also make it evident that most jobs of the near future and beyond will require some level of further education in either college or job-training programs.

It is important to acknowledge that many assumptions about the reluctance of adults to use technology in independent learning are misinformed, based largely on data and experience with adults who participate in traditional formal programs. A recent study comparing data on low-skilled adults in Portland, Oregon and London, England found that the experiences of learning to use technology in and/or for employment boosts literacy proficiency.⁷ Moreover, a National Institute for Literacy analysis (2008) of multiple surveys and research about the attitudes of these adult populations indicates that *“adult learners across the literacy and language spectrum show strong motivation to gain computer literacy skills, perceived as key to work advancement.”*⁸

Significantly, “technology,” which encompasses both tools and content, is also growing easier to use, becoming more portable, less expensive, and widely available. In addition, while adults without high school diplomas, the unemployed or those with low-wage jobs, and non-English speakers are less connected to computers and the Internet than other segments of the population, the growth in connectivity for this group is expanding rapidly.⁹

B. The Tools of Technology

Using technology – or more specifically the *tools* of technology – to expand education is only as valuable as the learning or program management it enables. What repertory of tools is available and what is the best use of various tools to enable access, learning, and program and data management?

A partial answer to this question is that “it depends.” From the standpoint of learning, it depends on the individual learner; his or her learning style, experience, and knowledge; program content; whether a tutor or other type of support is necessary; and a host of other issues. It depends on how well suited the particular technology is to the content and purpose of learning: Is there an immediate need for a piece of information, for advice from a family member or colleague, for real time guidance for diagnosing a mechanical problem, or for ongoing course study? An interactive onscreen prototype* can work well for the operation of a mechanical device but it works less well for understanding dialogue in a play.

Apart from its ability to extend learning, technology in various forms can help manage programs and systems, provide options to teachers for professional development, support development of new lessons or curricula, and offer new ways of communicating with students in and out of the classroom. Tools such as “learning management systems” can enable program managers to track data on students, costs, outcomes, and other information required for financial, regulatory, and performance purposes. Teachers can access professional development, either formally in online courses or informally by watching videos of other teachers teaching. Other tools enable customized web spaces for class collaboration and communication.

Until recently, the content designed for particular technologies – whether for the learner or the program manager – has been developed to *supplement*, not replace, classroom instruction. In most cases, the content has been derived from a specific curriculum and its designated learning goals. The main attraction of these versions of technology has been to enable adults who were unable to attend regular on-site courses to participate, at a distance, in a formal education program.

* An “interactive onscreen prototype” is a program model that is interactively displayed on a computer screen or other device where the interaction is driven either by the mouse or by touch screen.

As technologies have grown more sophisticated and cheaper, and become a part of everyday life, some educators have begun developing approaches that enable an individual to access and manage his/her own learning. Sometimes called “self-directed” or “independent” learning, these approaches include pedagogical structures and content that enable an individual to learn, usually via the Internet, without participating in a formal program or being guided by an instructor/mentor. (This is not as simple a matter as it may seem. In technology-based informal learning – which is somewhat similar to the kind of nontraditional “self-study” that individuals used before the advent of universal education – there are challenges to overcome in content, appropriate assessment, and credentialing.)

Radio, television, and video (now CD-ROM and DVD) have been used the longest to enable learning, and they continue to be valuable supports. None of these technological tools requires access to computers or the Internet, although they frequently supplement learning activities that are best accessed via computer or only available via the Internet. The most significant limitation of these tools is that they provide only “one way” access, with no opportunity for real-time interaction.

Newer tools such as mobile phones and personal digital assistants (PDAs) have, from the beginning, offered portable learning via communication with others. But it is the ability to connect to the Internet and to access the World Wide Web that has enabled these devices to provide really significant learning options.

However, regardless of the level or kind of technology, these tools are only *platforms* for the content (courseware), and its form, that is placed on them. New options for access to learning may arise from new versions of the existing technology or from new ways of using it, such as the use of mobile phone keyboards for “texting.”

The value of these kinds of technologies for those who need adult education and work/college readiness skills is that they provide options for instructors and individuals that suit the particular needs of those who are unable to enroll in and/or complete education in the traditional system. They typically offer one or more of the following advantages:

- Drill and practice, interaction, and/or audio/video that extends and enhances the capacity of teachers with large diverse classes;
- Enabling instructors to customize lessons to suit particular needs (authoring tools, Web-based resources);
- Vibrant, relevant, and engaging content that can ensure an adult’s interest in remaining in education and in lifelong learning;
- Via the Internet and the Web, new ways of communicating, of relating to information and knowledge, and of gaining access to visual and audio exposures to other places, people, and things;

- Faster assessment of an individual’s literacy, language, and skills and with additional qualitative measures; and
- Access to information about the community services that are often essential to enable people to get to work or classes (e.g., child care, transportation, health care, immigration, unemployment).

The term “learning environment” suggests place and space – a school, a classroom, a library. But a learning environment can also be virtual, online, and remote. Learning environments are the structures, tools, and communities that inspire students and educators to attain knowledge and skills. Experts say that 21st century learning must take place in contexts that “promote interaction and a sense of community [that] enable [both] formal and informal learning.”¹⁰

(See Appendix D, p. 47 for an outline of the most common and/or promising tools of technology for adult education learning and program/data management purposes.)

C. Confronting Forces That Work Against Progress

The existing system of adult education and workforce skills must itself change in many ways if it is to be transformed into a coherent and effective system serving substantially more adults each year.

Two overriding challenges in the system generally are lack of capacity to serve very many of the people who need some level of basic, ESL, and workforce skills education, and lack of programs that are relevant and of consistently high quality. Whether technology-assisted or not, programs have developed over the decades in a haphazard way due to inadequate funding and inattention. They vary greatly in purpose, size, availability, quality, and connection to meaningful educational achievement and/or employment. Moreover, few states require demonstrated mastery of the specialized knowledge and skills needed to *teach* adults – and, in any case, the majority of adult educators nationwide work part-time, often as a second job,¹¹ partly because salaries are low and the profession is undervalued.

From the learner’s standpoint, adults too often do not have the *opportunity* for the education and learning they need. Some have been forced by family or other circumstances to drop out of a formal program and may be unable to re-join because there is a waiting list for students. As noted above, others who may wish to improve their knowledge and skills are often unable to locate a program at a convenient place and time or that has an opening, a reality that can quickly undercut motivation.

Numerous other problems must also be addressed. Most are quite well known. They include insufficient funding, absence of management and financial infrastructure to oversee the application and outcomes of technology, regulatory requirements that inhibit change, and difficulty potential students and professional educators have finding information about existing technology resources for basic education, ESL, and work readiness.

Furthermore, access to computers and the Internet in classrooms is limited. And often, even when that is not the case, needed software is lacking or the limited speed and/or bandwidth available results in ineffective use of that software. Moreover, public spaces with ICT access, such as libraries, are overwhelmed with the numbers who seek to use computers and who so often need assistance from their small staffs.¹²

We must also counter various administrative challenges. One is lack of comprehensive planning by local, state, and federal agencies. Another is the absence of well-developed financial systems that fully reflect the total direct and indirect costs of operation, and that deal with student aid issues for online learning. A third is the failure to take advantage of economies of scale in purchasing licenses for content. And, above all, the National Reporting System (NRS) that drives program funding does not take account of learning gains via “distance education” or of adults who may use parts of the system (such as a GED exam) but are not enrolled or counted in formal programs.¹³

Beyond these problems is the barrier of tradition and assumption – that is, traditionally held and widely shared views by many policymakers, educators, funders, and learners about how content and learning must be structured and “delivered.” Traditional education has been built on the premise that information is scarce and that access to that information should be provided at particular locations (in classrooms) – using content and/or curricula chosen by and available from others, and with options for further study or work open only to those with certain credentials. “Teachers” in this traditional view are regarded as the source of learning.¹⁴

Certainly this approach has served the nation well. But in a technology-driven society of almost limitless information and access, it can inhibit learning rather than promote it. Officials and educators have crafted a strategy that *attaches* technology to the adult education and workforce skills systems that already exist – essentially using computers and Internet access to deliver traditional curriculum using traditional methods, rather than as transformative agents or vehicles for new opportunities. Thus, changed attitudes must go hand in hand with efforts to overcome the other barriers cited. Otherwise, expectations that technology can enable significant expansion of and access to adult education and workforce skills services will not be met.

Of course, technology cannot solve all of these problems. But it can help programs in many essential and liberating ways. Its tools and methods can expand access and quality, reduce costs by improving management efficiency, provide education at a distance for adults who are unable to attend a class in person, and offer services for instructors who want to improve their skills or acquire new certifications. Numerous options have been available and proven successful for these purposes for some time now and at low cost. However, there has been little effort to take these initiatives to scale through distance education, where the bulk of instruction occurs individually outside of a formal classroom, at a time and place convenient for the learner.

Finally, simple lack of awareness is a problem. Although many recent studies call for heavy use of technology in education, awareness about what technology can accomplish is limited, as is

understanding about how to incorporate it into an adult education program. There is a shortage of information about the resources available for distance education, whether these resources are designed to support a formal program or self-study.

In addition, despite recent research evidence to the contrary, many educators remain doubtful about adults' ability to learn on their own successfully, especially those with very low levels of reading, writing, math, and English language.

At the same time, teachers and administrators themselves frequently have little or no experience in using computers and the Internet, either for their own needs or to support instruction. For that reason, they may feel unqualified to initiate distance education options. Moreover, the measures that guide federal funding for state and local programs require information on adults who are formally enrolled in a program, although recent changes in the reporting requirements accommodate "proxy hours" of distance education.¹⁵

Clearly, the obstacles to change are many and formidable. It should be a goal of all federal and state adult education programs to meet many of them head on. But an essential part of any serious, comprehensive plan must be a significant investment in distance learning. The scope of the nation's need makes it imperative. And, as discussed in the following sections, *distance education works*. As the National Commission on Adult Literacy observed, "*it can put the highest quality teachers in the world at everyone's doorstep.*"¹⁶

If this nation is to take advantage of the potential role of technology in bringing the adult education and workforce skills system to scale, it must do at least two things: (a) offer resources to service providers to enable wider, more effective uses of technology in the new system (toward the educational goals desired) and (b) develop and implement new practices and structures to support the different kinds of learning that technology can enable.

In doing this, such questions as the following will have to be addressed:

- How can technology be integrated into the current system without forestalling further development of technology-assisted learning for adults outside of formal programs?
- What steps can be taken to encourage and provide training to teachers to help them transition from "delivering" education to a role as guide or mentor or coach?
- How can new options for learning be funded in an economic environment in which it is hard just to maintain present funding for the current way of doing things?
- How can we ensure that more adults achieve GEDs, postsecondary education, and vocational/industry certification when their learning is determined by assessment measures designed for the traditional system, rather than by assessments appropriate to technology-based learning?

Section IV of this report (Building the Foundation, p. 28) recommends next steps for addressing this complex set of issues and questions.

II. HELPING ADULTS ACHIEVE THEIR GOALS

SOME SECTION HIGHLIGHTS

Comparative studies of distance only, classroom only, and “blended” classroom and distance education have found that adult education students have greater success in blended learning than in either distance or classroom learning alone.

Adults who study on their own (self-study) for the GED exam with no participation in a formal program pass at a higher percentage rate than those who participate only in a formal program with no self-study.

A determining factor in success is regular connection to a teacher in the role of guide and mentor.

Whether or not an adult completes classes and courses sequentially in a formal program is less important than whether an adult continues to study and learn, either with self-study and periodic program participation or through self-study alone.

Access continues to expand, particularly with the availability of mobile devices that tend to be cheaper than computers and provide more options for communicating with others.

Literacy proficiency is enhanced substantially by time spent in employment and exposure to ICT.

A. Distance Education Works

1. POSITIVE LEARNER OUTCOMES

Research and practice in using technology for learning among adults with low levels of literacy and/or English language ability shows that adults can be measurably successful in increasing their knowledge, including achieving the GED and entering postsecondary education.

“Distance education” ordinarily refers to the delivery of instruction to students who are separated from the instructor, using some type of technology to support regular and substantive interaction between the students and instructor, synchronously or asynchronously.¹⁷ As the preceding section shows, distance learning materials are delivered through a variety of media including, but not limited to, print, audio recording, videotape, broadcasts, computer software, web-based programs, and other online technology. Teachers communicate with distance learners via mail, telephone, e-mail, or online technologies and software. When combined with classroom attendance, distance education is described as “blended” learning.

Whatever the structure, the distance education/blended process is generally designed to replicate the traditional educational experience – teacher-led instruction, defined curriculum, and specified milestones required for advancement – albeit with the significant advantage of flexibility for the individual who is unable to attend a class in a particular location at set times. It enables the student to spend more time on task.

Adult education delivered via distance has proven to be successful for adults studying for GED, advancing ESL levels, and improving literacy, numeracy, and work-related skills. Many research projects, conducted in many different contexts at both state and local levels, have found that adults learn at least as well, and often better, via distance education than in classrooms alone. Comparative studies of distance versus classroom adult education in the U.S., Canada, Australia, and the U.K. have found that those taking the GED or advancing in reading, ESL, and other knowledge in blended programs, have slightly higher results than those with either classroom-only or distance-only study.¹⁸

Strikingly, a ten-year longitudinal study by researchers from Portland State University (for the National Center for the Study of Adult Literacy) found that adults who study on their own for the GED exam with no formal program participation pass at a higher percentage rate than those who participate only in a formal program with no self-study – 24 percent compared to 17 percent. The highest percentage of GED attainment – 27 percent – occurred among those who used blended processes, although this combined approach was only slightly higher than for self-study alone.¹⁹

These positive outcomes result in part from the learner’s ability to “self-pace,” taking as much or as little time as necessary to absorb material. Technology is particularly effective in the self-paced learning endeavor because, in its most basic form (video or audio tape), it allows repeat viewing and/or hearing of particular content. Technology also can support individual learning by providing access to multiple programs beyond the adult education system itself. Access to online learning offers even more effective options – from links to similar material that may be presented in different contexts, to interactive content that enables the learner to respond, receive feedback, repeat, or move on.²⁰

In addition to the importance of self-pacing, research from Canada concludes that a determining factor in success is regular connection to a teacher in the role of guide and mentor. Some evidence suggests that rather than the use of technology per se, it is the extra time and individual attention that a teacher offers to the distance learner that generates more positive outcomes than results of formal classroom learning.²¹

The teacher’s role is quite different in a technology environment than in a typical classroom, where material is delivered to students of differing abilities and time-on-task needs. Distance education designed to test different approaches to learning normally provide at least some professional development for this new role. In some cases, as in assisted-technology programs in Ohio, teachers are assigned mentors in their first year or two of teaching, in a form of

professional development via distance that is both valuable and cost-effective. In addition to the many online options available for teacher learning and support, a number of free programs incorporate technology into the learning process, including some tools that enable the teacher to develop his or her own lessons.²²

However, this method is currently limited in its ability to significantly *expand* access beyond the structured system of adult education, because of the requirement for instructors and the shortage of teachers with necessary additional training. It will take a substantial investment of financial and other resources to enable programs and teachers to handle large numbers of students in distance learning programs.

It is worth repeating that most studies and research, and most programs that have added technology to formal adult education offerings, have focused on adults enrolled in formal programs – although less than 10 percent of the adult learner population attends formal, classroom-based courses.²³ The fact is that we know very little about those who are *not* enrolled – that is, about the vast majority of adults who need some education to attain GED, and/or to move on to postsecondary education and/or training for work.

2. PERSISTENCE AND MOTIVATION

A solid body of research shows that a critical component of successful learning in adult education is “persistence,” in terms of both intensity and duration of study.²⁴ Persistence is a challenge to adult learners because changes in financial, employment, family, and other circumstances can force them to drop out during or between courses of study. In fact, programs that recognize this problem often try various strategies to help adults continue or return.

A concern frequently expressed about the use of distance learning is that students drop out in higher numbers than those in classroom-only study. Indeed, California’s 2007 comparative study of classroom-only, distance-only, and blended education, found that student persistence was highest in the blended category and lowest in distance-only.²⁵

However, more recent reviews of how many adult learners persist have determined that they “persist in learning inside and outside of a program *until they achieve their goals*.”²⁶ Thus, whether or not an adult completes classes and courses sequentially in a formal program is less important than whether that person also studies on his or her own, i.e., through “self-study”. Technology in these circumstances can enable program managers, teachers, and learners to track their progress via online self-assessments, regular reviews of class lessons and assignments, learner reports, and in other ways so as to facilitate a smooth re-entry into formal classes, and/or eligibility for assessments that demonstrate mastery of a certain level of material.

3. SELF-STUDY

It is widely thought that adult learners need, at the very least, guidance and support from an instructor or tutor, even when the primary mode of learning is self-study. However, the percentage of adults enrolled in formal programs (the base for data collection and educator experience) represents a small minority of the total population in need of adult education services – and until recently we have had little information about the majority, who do *not* participate.

This information deficit was filled in part in the aforementioned Portland study, which was based on longitudinal tracking over a 10-year period.²⁷ The study focused on adults without high school diplomas who did and did not participate in formal education programs. Some key findings are these:

*Of those who were studying for the GED who had never participated in an Adult Basic Education program, one in three (34 percent) had engaged in self-directed efforts to improve their basic skills. Moreover, adults with relatively weak basic skills were just as likely to engage in self-study as those with higher levels of proficiency. Those who engaged in self-study usually used workbooks designed for GED preparation, but more than one third of the study group (35 percent) reported using computer-based materials.*²⁸

Of course, self-study does not *require* the use of technology. It only requires access to materials that provide the information an adult learner needs to achieve his or her goals, whether that is to pass a GED test, learn sufficient English or basic skills for work or further education, or fulfill other needs and interests. But technology does provide access to a far wider range of material than is available from a bookstore, library or school, and frequently at low or no cost to the individual.

A number of states have developed their own online GED preparation options (for which tests must be taken at a monitored center) and/or offer authorized public programs, and many credible and accepted options for ESL study are available.²⁹ In addition, online opportunities for learning of all kinds – whether or not related to defined curricula – are increasingly accessible to learners with a computer or mobile device. Technology also simplifies communication with other learners, colleagues, family, or tutors for questions and support.

Again, the defining variable for any form of adult learning at a distance is access to the technology and skills to use it to achieve individuals' needs.

B. Access

To expand technology use for adults with low basic skills and English levels, individual learners must be given access to information about available formal or informal technology-based or technology-assisted education programs. But they must also know about the conditions under which they can learn effectively, have connectivity to suitable technology, and possess basic ICT literacy. These essentials are discussed below.

1. ACCESS AND CONNECTIVITY

Although computer and Internet access continues to expand significantly among all demographic groups, the least amount of access is available to those with low education levels, insufficient or no employment and low income, and blacks and Hispanics – groups with the greatest need for adult education services. U.S. Census data indicates not only that access is often lacking at home, but also that most adult education classrooms are not equipped with computers. Also, publicly available computer access at libraries and community centers can be overwhelmed with demand, in some cases limiting access to 30 minutes per person.³⁰

Frequently these locations have computers and software that are not powerful or advanced enough to support many of the newer learning options. And they do not always have connection – especially broadband – to the Internet. Despite these persistent barriers, access continues to expand, particularly with the availability of mobile devices that tend to be cheaper than computers and provide more options for communicating with others.³¹

Some 84 percent of *all* adults have a cell phone.³² Moreover, an April 2009 Pew Research Center survey found that 77 percent of all adults have a computer in the home, a figure that rises to 95 percent for married adults with one or more children. A companion survey by Pew on Internet use found that, of the 79 percent of all adult users who used the Internet at least occasionally, 60 percent have incomes below \$30,000 annually, 50 percent have less than a high school education, and 67 and 84 percent respectively are black and Hispanic. The highest percentage of activity is e-mail use (90 percent), but 88 percent of those surveyed use a search engine to find information.³³

As the sophistication of technology and content has grown, broadband connection to the Internet has become more necessary for access to newer education programs that provide greater choice of content and interactive capability. Despite the higher costs of broadband and absence of its availability in some locations, 63 percent of Americans have broadband at home. Further, the growth rates in broadband connection are significant from year to year. According to Pew's survey, of those in households with incomes under \$20,000 per year, adoption increased by 10 percent from 2008 to 2009 (from 25 to 35 percent). In households with annual incomes between \$20,000-\$30,000, adoption increased 11 percent (from 42 to 53 percent). Among high school graduates, the rate of adoption grew 12 percent (from 40 to 52 percent), and among rural Americans it grew by 8 percent (from 38 to 46 percent). The demographic group whose adoption rates show the least increase are blacks, whose adoption rate at only 3 percent, increased only slightly, from 43 percent in 2008 to 46 percent in 2009.³⁴

Although these trend lines are encouraging, there remains a “digital divide” for many millions of needy adults who could clearly benefit from access to learning via computers and the Internet. Nonetheless, as lower costs and the higher connectivity capacity of mobile devices and other technology tools keeps increasing, greater numbers of adults will gain access.

2. ICT LITERACY

Along with access to technology and programs, learners must have reasonably solid ICT skills so that they know how to use computers, the Internet, and other devices. They must be able to manage the operation of computers and the Internet, but they should also be able to search, evaluate, share, store, and connect information and processes. The traditional view is that such skills must be taught in classes, like those frequently offered in community technology centers. But recent research and other data indicate that adults tend to prefer to learn ICT skills less formally, with the help of friends, family, and colleagues. For example, a recent U.K. survey found that a significant government initiative to expand the number of adult computer classes and locations had limited or no impact in itself on the use of such centers.³⁵

Further, many CD-ROM and online sources provide either static text-based tutorials or interactive instruction in how to operate computers and access the Internet. They use voice, text, pictures, and images that enable individuals at any level of literacy to follow the steps. (Good examples are Microsoft's Digital Literacy program and The Learning Ladder.^{*}) Clearly we need more "user-friendly" hardware. It is encouraging that some has begun to penetrate the adult education market, such as touch screens instead of keyboards (originally developed for people with disabilities).

Adults give many reasons for wanting to learn how to use computers/mobile devices and the Internet. Chief among them is the growing importance of ICT skills in jobs.³⁶ The comparative longitudinal study of adults in Portland, Oregon and London, England (2007) posed questions about the rising importance of the use of and access to computers as part of contemporary employability. One of the study's central conclusions is that "employment and ICT use supports the development of literacy proficiency." Put another way, "enhancement of literacy proficiency is aided substantially by time spent in employment and exposure to ICT."³⁷

This apparent correlation between ICT use and literacy is reinforced by data from the 2003 National Assessment of Adult Literacy (NAAL). An analysis of responses to NAAL's survey questions about technology use and access found, in comparing users and non-users on the Document literacy measure, that about 10 percent *fewer* technology users had Below Basic scores compared to non-technology users. Further, about 10 percent *more* technology users scored at the Intermediate level compared with non-users. A similar pattern was found for the NAAL Prose and Quantitative literacy scores. Not surprisingly, technology use is strongly associated with higher literacy scores across demographic variables of income, education, and age.³⁸

There is evidence that adults find the use of technologies for learning to be a motivating force, both because of the relationship of ICT skills to employment and because they enable greater

^{*}<http://www.microsoft.com/about/corporatecitizenship/citizenship/giving/programs/up/digitalliteracy/default.mspx>, and <http://learningladder.org>.

flexibility for the teacher and the learner. In particular, mobile technologies (e.g., tablets and PDAs) encourage student interest and participation.³⁹

The Portland study indicates that “informal learning through computer use may offer avenues for development of new literacies not available in formal programs.” For example, “websites about popular culture can present more complex literacy demands than the texts encountered in some literacy programs, computer games develop a kind of analytical experience or expertise not always called for in the classroom, and adolescents develop voice and identity through writing on line.”⁴⁰

In short, whether an adult has no experience using computers or the Internet or is well-versed in ICT skills, technology offers an entirely new environment and learning experience that adds to or can go beyond the traditional classroom experience of instructor-led text-based formats. This learning environment is as much about information and communication as it is about technology. In their use of technology for learning, adults at all levels of education, knowledge, and skills rely heavily, and increasingly, on communities and networks of others – colleagues, fellow students, instructors, experts, family and friends, strangers with similar interests or in similar professions, and many others – to support all kinds of learning.

In *Giving Literacy Away, Again: New Concepts of Promising Practice* (presented at the Twentieth Annual Rutgers Invitation Symposium on Education, 2003), the author concludes that there is a more expansive concept of the adult literacy learner as one who “chooses among a range of literacy development strategies and resources....” The report states that “differences among learners’ preferred modes of learning, their life circumstances, and the accessibility of learning resources such as classes shape their choices about how to pursue literacy development.” In considering systems that can offer these options, it is essential that “mapping of programs, services, and materials does *not* retrofit them to a narrowly prescribed framework.”⁴¹

Of course, data from these studies are lagging indicators in an environment that is constantly shifting. They are snapshots at particular times during a period of rapid change in development, use, access, acceptance, and understanding of technology in all aspects. Nevertheless, the results are exciting and the potential is evident for using technology to expand adults’ access to programs that will qualify them for college and work.

What’s needed are *effective policies and supports* to develop ICT skills and *managing transitions* in a new adult education and workforce skills system in a way that makes independent distance learning for the individual valuable and successful.

C. Going to Scale

1. CHANGING THE CONTEXT

Whether the goal is to improve the traditional adult education system or foster development of the new system envisaged by the National Commission, it is of first order importance to aggressively expand awareness of the technology resources available for basic, ESL, and workforce skills. Taking steps to integrate technology into administration and management is a close second.

Expanding Awareness. As discussed earlier, a wide variety of technology is currently available, along with the applications and practices associated with their use. But few people – including teachers, students, and even the experts – know of more than a few of them, and knowledge often comes during random searches and/or by word of mouth. A central source of information on the full range of options available would significantly increase the speed of awareness and use. Without it, access to technology-based learning will remain out of reach for most adult learners.

Fortunately, the Internet and World Wide Web are ideally suited to help meet this challenge because they enable the spread of information “virally” by individuals and small groups without reference to organization or government choices. Equally important, technologies such as “wikis” (“Wikipedia” being an example) make it possible to provide both a central location for information that can be easily expanded and changed and a means through oversight by the wiki hosts to ensure its credibility.

Management Tools and Practices. Many technology tools and systems are also on the market for adult education administrators, program managers, and instructors. They can help these professionals collect and analyze financial data, track student enrollment, determine persistence and outcomes, assess performance online, and measure these data according to federal, state, and private regulatory and funding requirements. Some of these “learning and content management systems” (LCMS) are low cost and some are freely available online, such as Moodle and HTrack (see Appendix D listing, p. 47). Most have been tested and used successfully in K-12 education, which is an especially appealing market for product development by virtue of its size and level of funding. Curricular content and learning/instructional approaches are different for adults than for children and youth, but K-12 systems of data collection and management can be easily adapted to adult education.

Similarly, technology platforms and content are available for teachers who want to develop their own lessons or courses or provide opportunities for their students to create their own websites and wikis. Free online options, such as Moodle, are in wide use already and often include online “communities” of teachers with similar age groups, subject matter, concerns, and questions. (See Appendices D and E for more examples.)

Professional teacher development and certification programs are also available online. They include both informal and formally structured courses and have the advantage of being available around the clock at times convenient for the teachers.

But awareness of the tools and access alone are just first steps. Most managers and instructors must learn how to work with them, and how to develop new ways to support their use. Too often, individual programs or education districts decide to find and purchase technologies for distance learning or data purposes with little effort to get needed training or to exchange information and experience. Yet such technical development is vital if use is to produce positive results and generate economies of scale.

The bottom line is that adult education and workforce skills entities need to plan carefully for technology acquisition and implementation, and they need to align the technology with strategies for enrolling and educating students. To this end, *partnerships between the public and private sectors – one of the recommendations of the National Commission on Adult Literacy – could jump-start the process, by initiating and promoting expansion of best practices and models.*

2. SUPPORTING THE LEARNER NOT THE SYSTEM

Distance education, additional professional development opportunities for teachers, better program and data management tools, and increased funding and more visibility – all will help expand access for adults and improve their learning opportunities. Yet these changes will serve significantly larger numbers of adults only if flexibility is built into the system to serve adults in many different ways.

For example, credentials and certifications should be developed that are appropriate to the various forms of technology-based learning and reflect that the individuals holding them possess the required skills and knowledge – and they should be based on accepted standards for content, assessment, and outcomes. Adults who need basic education, ESL, and other skills and knowledge to enter and succeed in college or find jobs, must seek, engage, and maintain connections to the adult education and workforce skills system. Technology offers the means for making such connections possible on a widespread basis, whether or not an adult chooses to participate in all, some, or no formal programs.

Various technological options, if properly organized and marketed, will allow adult learners to pursue the education they need for GED and college- and job-readiness purposes, and for formal assessments of their achievement. The options include online courses and curriculum, sample assessments for particular lessons or modules, periodic communications with an instructor or regular access to an online tutor. These and other means will allow adult learners to validate their learning achievements and move effectively toward their goals. Unfortunately, the current adult education system is largely disconnected from the traditional “pipeline” of pre-K through postsecondary education, which in effect isolates adult learners. Yet, as adult learners in and out of the workforce become more mobile and freer to choose where, how, and

when they can access education through technology, accumulated experience indicates that they are likely to look to programs more interconnected with mainstream education options.

In transforming learning through the use of technology, old ways of doing things will not always be appropriate – e.g., in determining how and in what form content should be available, and in designing learning assessments. New structures and processes must be developed to accommodate the new reality: Individuals should be able to access knowledge, skills, and information not only by using multiple media at any time or place, but in different formats, structures, and quantities, and for different personally determined purposes.

English-language ability may be necessary for an immediate purpose, such as a job or promotion or to meet financial or family responsibilities. A short-term, targeted language option is not sufficient for the long term but serves the individual's immediate need. Access to web-based vocabulary and translation offers a missing word or phrase "just in time." These kinds of options are in place already, but they represent little more than transplanting the traditional and familiar process of education to an online environment.

Successful programs that lead to jobs and further education for low-skilled adults, whether or not technology is involved, have often designed the experience to suit the needs of the learner, not the needs of the system. As governments, educators, employers, and technology developers consider how to take advantage of technology without losing the value of needed support systems, they will have to determine what the new environments should and can be, and which technological tools are appropriate to enable maximum learning.

In short, good technologies and good uses of technology offer the potential to provide education that is *customized* to the learner, whether in an instructor-led classroom or in learning at a distance on one's own. Self-study appears to be effective with adult learners when they have identified one or more goals and are able to structure the necessary learning to reach their goal(s). Evidence abounds that distance education offers increased flexibility, cost-effectiveness, and successful outcomes, but until the classroom is no longer viewed as the focal point for all learning, significant change, along the lines discussed, will not occur. Traditional assumptions about the interest and ability of low-skilled adults in using technology for learning are not valid and need to change as well.

Section III presents additional findings from major research on adult and distance learning. The findings support the conclusions drawn above.

III. RECENT RESEARCH FINDINGS

This section highlights key findings from several recent longitudinal studies that relate to the use of technology for adult education learning. The studies share all or most of the following characteristics:

- They were initiated by or managed under the auspices of a government agency.
- They have tracked data over time.
- They include information about participation by both teachers and learners.
- Multiple reports and analyses about them have been developed and published.*

Three of the studies summarized here are from the United States: the California Distance Learning Project (CDLP); the Portland Longitudinal Study of Adult Learning (LSAL), and Project IDEAL (a multi-state consortium based in Michigan). The other two are projects of the United Kingdom's National Research and Development Centre for Adult Literacy (NRDC) and of Canada's Ontario Literacy and Basic Skills Program.

Two previously cited federal reports are also included here because they relate closely to the above work. They are a comprehensive review and analysis of adult online learning experiences from the National Institute for Literacy and an evaluation of evidence-based practices in online learning from the U.S. Department of Education.

As noted, much of the initial research into the use of technology in adult learning has focused on comparing outcomes among adult learners in three categories: those who participate only in classroom-based programs; those who participate only in distance learning; and those who participate in blended classroom and distance activities.

- First, these studies have focused primarily on distance learning and content that supplements traditionally structured classroom curricula, lessons, assessments, and other measures developed for formal programs. Those who learn outside of these frameworks cannot be evaluated and their learning outcomes are unknown.
- Second, much of the learning content used is video/TV-based and offers no opportunity for the student to respond and receive feedback as the program progresses, an option provided by many online programs, such as Workplace Essential Skills and English for All (see Appendix D, p. 47).

Limited data exists about the experience and learning outcomes of adults using technology for adult education. Those who are not enrolled obviously cannot be easily identified, questioned, assessed, or otherwise considered. Nonetheless, data that *is* available provides valuable insights into adults at different levels of literacy and skill who use technology-assisted learning.

* The numerous publications that have resulted from each of these studies are listed near the end of the Bibliography section of Appendix F, p. 59.

A. California Distance Learning Project (CDLP): Adult Learning Activities

The Adult Education Office of the California Department of Education sponsored the CDLP Project, from 1995-2007. The California State University System managed and directed it, and OTAN, the Outreach and Technical Assistance Network of the Sacramento County Office of Education, was the subcontractor for all Internet and information distribution activities including website management. The CDLP website is presently operated under the auspices of OTAN (www.otan.us).

Because of its scope and longevity, the CDLP is one of the most valuable initiatives in this area of research. From 1995-2007, the study tracked almost 60,000 students each year – using consistent measures for persistence and outcomes and comparing participation in distance, classroom, and blended courses.

State legislation permits California adult schools to spend up to 5 percent (15 percent as of January 1, 2009^{*}) of their apportionment on nontraditional education approaches. Most of these are commonly called “innovation programs.” They meet the CDLP’s definition of distance learning, which has four elements: separation of teacher and learner in space and/or time during at least a majority of the instructional process; two-way communication between teacher, tutor, or educational agency and learner; use of educational media to unite teacher and learner and carry course content; and student control of learning pace and frequency rather than control by the distance instructor.⁴²

ESL programs represent about 90 percent of the 59,000 learners enrolled in program year 2005–2006. CDLP evaluations show positive outcomes for students in classes where distance learning is a supplement or an option for self-study, if a student has to “stop out” of regular class attendance. Students who participated in blended learning in 2004-2005 (regular class attendance plus supplemental distance learning) demonstrated greater gains on California’s post-test than students in traditional ESL classes, with lower levels of proficiency showing the greatest percentage gains.

The innovation programs’ level of participant completion was better overall than adult school classroom programs, *with blended learning showing the highest completion rate*. However, distance learning-only programs showed the lowest levels of persistence.⁴³

More than 45 percent of participants in the innovation programs reported having nine or less years of schooling. About half (nearly 52 percent) of the 2005-2006 participants reported having no earned degrees. More than a quarter (about 27 percent) had high school diplomas or

* It should be noted that California’s 2010 budget includes significant cuts to all levels of education. School districts have been given the option to ignore funding for adult education innovation programs.

GEDs. More than 25 percent of the ESL learners were at beginning literacy levels at the time of entry and some 5 percent were determined to be at the intermediate levels.⁴⁴

For further information about the CDLP, www.cdlponline.org.

B. Portland's Longitudinal Study of Adult Learning (LSAL)

Portland State University conducted the Longitudinal Study of Adult Learning (LSAL) from 1998-2008. This study compares the experiences of two groups: adults who participate in formal Adult Basic Education (ABE) programs and those who do not. The population was a statistically representative sample of 940 adults ages 18-44 living in the Portland metropolitan area. At the time of their screening in 1997, they were not in high school, were without a high school diploma or GED, and were proficient speakers of English (not necessarily native speakers). The study collected six waves of data over nine years with repeated interviews and skills assessments.

Early LSAL data indicate that of those in the study who participated in a formal ABE class prior to 1998, nearly half (46 percent) also engaged in self-study to improve their reading, writing, or math skills or to prepare for the GED. Among those in the population who had never participated in an ABE program, one in three (34 percent) had engaged in self-directed efforts to improve their basic skills.

Adults with relatively weak basic skills were found to be just as likely to engage in self-study as those with higher levels of proficiency. In fact, the higher the literacy proficiency level, the less likely adults in the LSAL sample were to engage in self-study to improve their basic skills (although more than 30 percent of adults at the highest levels of proficiency engaged in self-study to a significant degree).

About 17 percent of those who participated in a formal basic skills program but did not self-study received their GED, compared to 24 percent of those engaged in self-study who did not participate in a program. The highest percentage of GED attainment (27 percent) was observed among those who did both.⁴⁵

An analysis of the computer-related data from the survey provides additional findings:⁴⁶

- At baseline, working, household income, and owning a computer predict computer use. Controlling for these characteristics, literacy proficiency significantly predicts computer use status.
- People with higher literacy proficiency scores are earlier adopters of computer use. New adopters at each time period surveyed reach into progressively lower levels of literacy proficiency.
- Most adults born before 1968 learn computer skills informally or at work, while younger users are taught in school. Participants of adult education programs were not more likely to

be computer users than non-participants. All users prefer to continue to learn new computer skills through trial and error and with help from friends and family.

- Popular culture and informal learning through computer use may offer avenues for development of new literacies not available in formal programs.⁴⁷

For more information, <http://www.lsal.pdx.edu>.

C. **Project IDEAL**

Project IDEAL is a consortium of states that have been working together since 2001 to develop effective distance education programs for adult learners. The founding group of 15 states has grown to include 27 current and alumni members.* The Project IDEAL Support Center at the University of Michigan provides member states with technical assistance for program planning, teacher training, and program evaluation. It also develops training materials, online courses, and Web-based research tools that member states use to manage and improve their programs.

States vary widely in the scope and structure of their distance learning programs. In 2004-2005, California served some 51,000 adults—mostly ESL learners—outside of classroom programs, primarily using a video checkout model.⁴⁸ On a smaller scale, Pennsylvania offers distance learning using online, video, and print materials through both a centralized distance agency and local adult education providers.⁴⁹ Ohio offers both GED and ESL courses at a distance.⁵⁰ Each of these states has tracked data for their programs not only in relation to student outcomes but also to program challenges for teachers, validity of structure (within the state's system or independently), support needs for students and teachers, and other issues.

States with ongoing projects and data tracking show evidence of educational gains on the same standardized measures used to assess classroom learners, allowing state and national policy makers to include them in their counts of students served.⁵¹ In addition, 85 percent of adult distance learners report that they would take another distance course.⁵²

The member states' experiences over time demonstrate that designing, developing, and implementing successful distance learning has as much if not more to do with the systems and processes as it does with which technologies are used. For example, commitment and support at the state level is highly important, including a state-level person charged with overseeing the initial efforts. Other important variables are funding, teacher training in the initial stages of implementation, ongoing professional development for distance teachers, careful planning and evaluation of small scale efforts to determine which distance strategies work within the state, and sufficient time for the program to mature.⁵³

Initial costs in this model frequently exceed those for classroom-based programs. But the costs tend to drop dramatically over time, as teachers and adult education programs become more

* Member states include: WA, ID, MT, AZ, NM, TX, OK, MO, IL, IN, MI, OH, PA, NY, ME, MA, FL, MD, DC, WV, KY, AR, LA, GA, FL, SC, NC.

skilled at recruiting and supporting the appropriate learners. Additionally, since distance learning has the potential to increase the number of students served, it is necessary to allocate funds to cover the growth in services that must be provided.

For more information, <http://www.projectideal.org>.

D. National Research and Development Centre for Adult Literacy (NRDC)

NRDC was established in 2002 by the U.K. Department for Education and Skills, as part of *Skills for Life*, the national strategy for improving adult literacy and numeracy skills. A 2008 report of the NRDC compared longitudinal data from the LSAL study in Portland with a cohort in London, taking as its context the rising importance of using and accessing computers as part of contemporary employability.⁵⁴

The central conclusion of this study is that “employment and ICT use support the development of literacy proficiency.” In other words, “enhancement of literacy proficiency is aided substantially by time spent in employment and exposure to ICT.” There is less evidence of effects in the other direction, i.e., of improved literacy proficiency influencing the take-up of ICT or the likelihood of getting employment. The authors point out that ICT skills cannot be viewed in isolation from other aspects of employability, in which literacy proficiency has a central place.⁵⁵

A second NRDC study looked at quantitative and qualitative data from research between 2003 and 2006 of approximately 500 adult learners and tutors. It focused on questions about improving teaching, learning, and assessing literacy, numeracy, ESL, and ICT with attention to factors that contribute to successful learning. These took place only in classroom, instructor-led, and/or mediated environments and were not compared with distance options. Evaluation trials showed that learners involved in this study improved in almost all cases in both literacy/ESL skills and ICT skills and confidence, often to a statistically significant degree.

Most users found the use of ICT motivating. Mobile technologies (tablets, PDAs, mobile phones) were found to be particularly motivating, and enabled greater flexibility in teaching. As was found in the comparative study of Portland and London, the relationship of ICT to employment is one of great significance for many adults, and it is often part of the reason they enroll in these courses.⁵⁶

For more information, <http://www.nrdc.org.uk>.

E. The Literacy and Basic Skills Program of the Ontario Ministry of Training, Colleges and Universities (MTCU)

The MTCU’s Literacy and Basic Skills Program initiated a project to explore distance learning for literacy services among four agencies from 2003-2005. The distance learners enrolled in this project were mostly women aged 27-39 who had not completed high school and who were

enrolled primarily to allow them to work at their own pace or to accommodate family or job obligations. Most of the learners had not enrolled in an adult education class for a number of years and most had held their previous enrollment for less than a year.

Among the key findings:

- *Significant barriers can be overcome by focusing on the needs of learners and their communities.*
- *Distance learning can be an effective tool with low-level literacy learners.*
- *Learners appear to be able to sustain their efforts in the program with a relatively small number of hours of direct instructional contact (an average of less than 2 hours per month).*
- *Instructors for distance learning spent more of their time in preparation and learner support, unlike traditional instructors who spend more time in direct instructional delivery.*
- *Sites reported that learners were most successful in self-management when:*
 - *Web portals and customized websites provided access for posting frequently updated information;*
 - *Computer skills orientation enabled learners to navigate with self-efficacy and thus minimized the need for troubleshooting support; and*
 - *Frequent and regular communication among learners occurred, facilitating a learning community and peer-supported learning environment.*

For more information, <http://www.edu.gov.on.ca/eng/training/literacy/index.html>.

F. Investigating the Language and Literacy Skills Required for Independent Online Learning, (National Institute for Literacy)

This report by Heidi Silver-Pacuilla, published in 2008, is included here because it provides a comprehensive review and analysis not only of the summary studies described above, but also of many other studies, research, and interviews that pertain to adults and distance learning. In addition, its author conducted a secondary analysis of the 2003 National Assessment of Adult Literacy (NAAL) dataset to provide a more detailed profile of technology use among populations with low literacy and low English language proficiency.

The purpose of this report was to investigate the threshold levels of literacy and language proficiency necessary for independent study on the Internet. A major finding of the work is that thresholds do not exist. The report states that:

“Learners at even the lowest levels of literacy and language proficiency can engage with online learning content. Moreover, all reports indicate that they are eager to do so and that they benefit in important ways, such as in self-confidence, self-directedness, and independence. Adult learners across the literacy and language spectrum show strong

*motivation to gain computer literacy skills, perceived as key to work advancement. Ultimately, it became apparent that the interaction among the learners' skills, the opportunities they encounter, and the supports available determines those thresholds.*⁵⁷

Other key findings are that:

- *The centrality of work readiness to the learning lives of adults provides a key leverage point for programming and content design to address this goal more directly and, through it, more basic literacy and language skills.*
- *Adults' existing family and social networks that have proven critical to learning pursuits with technology provide another leverage point that could be tapped with community-based, authentic learning environments, activities, and products.*
- *Self-directed skills valued by lifelong learners can be nurtured by providing facilitated access to online, independent learning environments.*

The results of the NAAL analysis are especially noteworthy. In a comparison of Document literacy scores, about 10 percent *fewer* technology users had Below Basic scores compared to non-technology users, and about 10 percent *more* technology users scored in the Intermediate level compared with non-technology users. A similar pattern was found for Prose and Quantitative literacy scores.⁵⁸ Further, technology use is strongly associated with higher literacy scores across demographic variables of income, education, and age.⁵⁹

G. Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies, (U.S. Department of Education)

This literature review and meta-analysis (2009) is relevant here because 44 of the 51 study effects examined were drawn from research on older learners. The project was sponsored by the Center for Technology in Learning of the Office of Planning, Evaluation, and Policy Development of the U.S. Department of Education. The analysis was limited to a search of studies of web-based instruction. It includes only those with random-assignment or controlled quasi-experimental designs, and it examines effects only for objective measures of student learning.⁶⁰

Among the findings are:

- *Students who took all or part of their class online performed better, on average, than those taking the same course through traditional face-to-face instruction.*
- *In many of the studies showing an advantage for online learning, the online and classroom conditions differed in terms of time spent, curriculum, and pedagogy. It was the combination of elements (likely to have included additional learning time and materials as well as*

additional opportunities for collaboration) that produced the observed learning advantages. It should be noted that online learning is much more conducive to expanding learning time than face-to-face instruction.

- *Giving learners control of their interactions with media and prompting learner reflection can enhance online learning.*

IV. BUILDING THE FOUNDATION: NEXT-STEP RECOMMENDATIONS

The case for deploying technology to expand and improve America’s adult education and workforce skills enterprise is evident. Critical learning and management needs, barriers to overcome, and achieving economies of scale – all are areas where technology is uniquely suited to help us get “from here to there.”

A number of successful policies and practices are already in use at the state and local levels. They are valuable guiding lights and we can build on them. Yet, at this point in time, there is little awareness or acceptance of these initiatives and no serious moves to use technology on the scale needed either locally or beyond the governmental or geographic boundaries of states and communities.

The National Commission on Adult Literacy calls for connecting the adult education system to workforce and economic development activities. The potentially transforming capacity of the Adult Education and Economic Growth Act of 2009 (AEEGA) recently introduced in Congress* calls for the same thing.

The following recommendations are largely common sense actions, and they are interconnected in many ways. It is a given that for their full, effective implementation, federal and state leaders in both the public and private sectors must take an active role.

A Establishing a National Web Portal

Until information about program options is available nationally, on a comprehensive and credible basis to adult learners and program professionals alike, the nation will not be able to expand access to learning significantly. We recommend a national web portal, with the specifications indicated below – although we should note that because of the scale and diversity of their needs, an equally compelling case can be made for two portals, one designed for adult learners and another for professional use.

But whether there is one portal or two, presentation of content has paramount importance. Users, especially low-literacy learners with limited ICT skills, must be able to move quickly to the content they want (with a minimum number of clicks) so as to ensure maximum participation. Page appearance and navigation must be designed very differently for the two different user groups, and the essential differences should be immediately obvious on the website home page. Moreover, too often, valuable online information and materials go unused because of lack of awareness. Thus, a key component for the success of any portal is sustained

* The Adult Education and Economic Growth Act (AEEGA) was introduced in Congress in July 2009 as H.R.3238 (Rep. Patrick Kennedy) and S.1458 (Sen. Jim Webb). To access the AEEGA, search for Adult Education and Economic Growth Act at www.thomas.gov.

dissemination and promotion of information on learning options available, in ways that most effectively reach the specific target audiences for which it is designed, especially adult learners.*

1. For Professional Use

One section of the Portal should be specifically designed for professional use – for those who plan, operate, teach in, evaluate, and fund technology-assisted adult education and workforce skills programs. It would be accessible to instructors or advisors with professional development needs, officials and administrators with management and measurement needs, employers with specific occupation or professional needs, research funding agencies, and many others. At present, awareness of and access to the plethora of information available for these multiple purposes too often depends on accidental discovery, word of mouth, or extensive hit-and-miss Internet searches.

For professional and skilled users, the Portal will collect, review, and provide:

- Links to high quality tools and applications that make program management more efficient and effective, including information on technology planning and about state and local policies and regulations for students learning online.
- Platforms, tools, and content – reviewed for quality and credibility – that enable classroom teachers and distance guides/mentors to develop and make use of content for their own and learners’ use.
- Links to online professional development options (such as webcasts, podcasts, streaming video tutorials, and online courses), practices for teaching and guiding learners at a distance, and online “communities” of other practitioners.
- Links to evidence- and outcomes-based research on technology-based/distance adult learning.
- Information on existing financial aid for students in distance learning programs.
- Links to related programs, websites, resource collections, curricula, and other data.

2. For Adult Learners

The other Portal section, clearly and immediately differentiated in appearance on the home page, would be geared to the varied needs and skill levels of adult learners.

* The AEEGA also recognizes the need for a national portal as part of its call for the establishment of a new National Adult Learning and Technology Resource Center.

To make use of already-existing technology-based learning programs, adult learners must have easy access to a single source of credible information about them, as well as guidance on how to identify and navigate programs suited to their needs, and how to move along pathways to learning assessment and certification. This part of the website must be designed to be “user-friendly” for the majority of adult learners, including those with low levels of literacy and/or ESL and those who have limited Internet access or little beginning knowledge of computer use. It also must be easy to navigate on mobile devices for those without access to computers or the Internet at home or work. Even websites that currently purport to serve these adults rarely provide links to other program options and they are not designed for easy access and navigation.

The Portal section for Adult Learners should be the central repository of all adult learning programs and content available – in an online environment where everyone, including young adults, can improve their reading, writing, ESL, math, and basic workforce/workplace skills in an interactive fashion at their own convenience.

For student learners, the Portal should include, though not necessarily be limited to:

- Online “self-study” options designed for formal certifications, such as GED, and options that offer informal learning of all kinds.
- Links to appropriate learning assessments.
- Easy-to-access information on formal programs, testing centers, online tutors and guides, study materials, and other useful content.
- Links to individual platforms, applications, and curricula for adult learning, and to teachers and learning facilitators.
- Information about and links to relevant workforce and workplace programs, including those that provide online skills assessment, online training for work readiness skills, information about job openings, and other practical assistance.
- Information on nationally available online certificates and degree programs that respond to identified high-growth areas in each state.

The National Portal should be established and run by an independent interagency federal body. The National Institute for Literacy (NIFL) would be ideal in this role as long as it retains an independent structure, adopts a futures-oriented agenda, and is adequately funded.* It is suggested that an Advisory Board, perhaps broken into subcommittees that focus on the two user groups, be formed to help the responsible entity develop guidelines for the content and operation of each Portal section.

* As urged in the AEEGA, and proposed in a new CAAL paper [Rebuilding NIFL to Meet Future Needs: A New Agency with a Broader Mission](#), October 9, 2009, available as NC-CAAL10 from www.caalusa.org/publications.html.

This Advisory Board should include adult educators, potential users, technology learning experts, workforce/workplace development interests, leaders from business and labor, curriculum development specialists, experts in technology-assisted learning, program planners in adult education and workforce skills development (including ESL), assessment experts, and perhaps vendors and others, and software and device-specific application developers.

The goal should be to establish and effectively market databases that are comprehensive, credible, and easy to keep current. They should provide links to best practices, courses, and programs, both commercial and non-commercial, from public and private sector sources in both the U.S. and abroad.

3. Ensuring Relevant Portal Programs and Content

The relatively small volume and variety of currently available online programming will require ongoing development of new programs and content. Thus –

- The Portal Advisory Board should aggregate and assess existing freely available content and websites in each area of adult education (ABE, ASE/GED, ESL, work- and college-readiness) to determine if the content is of sufficient quality and range for the needs of both professional and low-skilled adult learners.
- The National Institute for Literacy (NIFL) or equivalent federal entity, in cooperation with other federal agencies, should fund development of new and existing programs, content, and applications for adult education via an RFP process – with eligible applicants to include nonprofit and for-profit groups, education institutions, partnerships of adult education and workforce skills, and individuals with proven credentials.
- NIFL or other appropriate federal entity, with assistance from its Advisory Board, should maintain regular communications with the ICT industry, technology-assisted learning researchers, and vendors – to ensure that new versions of devices and device-specific applications (especially for mobile learning) and new technologies for accessing content are incorporated into available information on both sections of the Portal.
- NIFL or other appropriate federal entity should maintain regular communications with non-governmental organizations and community-based organizations and others – to ensure effective outreach to adults who do not participate in formal programs and services.

4. Factors in Determining Portal Costs

The costs for establishing and maintaining the National Portal cannot be determined at this stage because they depend on the outcomes of planning and on choices made among many possible variables. Moreover, each of three basic web portal components – the development of

the website itself, monitoring and updating content, and developing new content – requires different approaches to estimating costs.

Establishing the Portal. An essential requirement for any site, regardless of user audience, is the ability to track and measure use and variations in use in order to determine if the website accomplishes its goals. Such evaluation components have differing cost implications and require particular specifications for the website’s underlying “architecture.”

Other technical requirements for websites vary depending on the needs of the target audience. A typical “portal” site provides little more than subject/issue/user categories with links to content listed accordingly. This kind of option, which is less costly than a website “customized” to the target users, would be feasible for initial establishment of the Portal’s section for professional/skilled users.

The Portal section for adult learners will cost considerably more to develop because it is more complex. For example, it will need a user-friendly design that reaches all skill levels. Learning must be structured to suit specific goals, such as acquiring a GED, reaching a particular level of English speaking/understanding and/or writing, and attaining a vocational certification. [See Learner Web model, Appendix E, p. 52.] In addition, options must be provided for self-study, as well as for learners supported by teachers or tutors – content should provide for feedback from and to individual users, learning sequences customized to the individuals’ response, frequent and regular assessment that enables learners to self-assess whether they have learned the content, and other functions.

Updating the Portal. The main costs for updating the portals are associated with identifying and evaluating new programs and content, adding new material to the sites, and upgrading the sites as new technologies are developed. The cost of adding new material depends on whether the content has been designed for an online environment that uses the most sophisticated pedagogical and technical designs or whether it is a program with simpler functions.

The SCORM model described in Appendix D (p. 47) is one cost-effective approach. Developed initially by a consortium of the U.S. Department of Defense and other federal agencies, universities and other research institutions, and technology companies, SCORM (Shareable Content Object Reference Model) makes it simple to develop, use and re-use, and move from one curriculum or course to another. Moreover, SCORM includes simple and cost-effective methods for storage and access of material, and “open source” websites and content also enhance options for user input and free access.

Developing New Content. The costs of developing new content, although these are not necessarily annually recurring costs or dependent on federal outlays alone, will be higher than the costs of building and routinely updating the Portal, perhaps upwards of \$1 million for one new multimedia ESL or basic skills course.

The AEEGA recommends new funding of \$250 million for all purposes in its proposed Title III called 21st Century Technology and Skills for Adult Learners. The proposal includes \$7.5 million

to support a NIFL-managed National Adult Learning and Technology Resource Center where a national web portal would be based. Judging from our discussions with those who operate existing portal sites, this level of proposed annual funding should be adequate to cover both initial and recurring costs for Portal development and maintenance.

B Encouraging State Leadership

Self-study activities need to be grounded in particular state and regional service programs where learning gains can be formally verified, and where communities of need can be reached through targeted awareness and outreach campaigns. State planning and leadership must go hand in hand with federal leadership. Although states must see adult education as their own and not just a federal issue, in the present economic climate concrete federal incentives will be needed.

It is recommended that the federal government launch a grant program designed to help states integrate technology-assisted learning systems and/or programs into their overall adult education and workforce skills planning. Each state – based on planning that involves all essential stakeholders – should be challenged to:

- Develop a statewide plan to integrate technology into its adult education and workforce skills system;
- Provide professional development for those who teach in and manage adult education, literacy, and workforce/workplace skills services;
- Give adult learners and eligible providers access to curricula, instruction, and assessment;
- Develop innovative pilot projects or improve existing programs to expand the use of technology to adult learners; and
- Align adult education services (in ABE, ASE/GED, ESL), postsecondary education (especially community colleges), and occupational/workforce skills programs so that comparable course content and credit earned in one part of the system can transfer as credit to another.

The National Institute for Literacy or other appropriate body should form a new Advisory Committee of the States to help develop the grant program. This Committee should be sensitive to variances in state need, know first-hand about well-run and solidly designed systems and programs, and value the provision of information and access across state boundaries.

C Supporting Distance Learning Programs

Federal and state leaders must think outside the box as they work to offer effective distance learning options that extend beyond formal programs and as they face the need to validate gains that occur through independent learning.

The national web portal constitutes the cornerstone of this proposed plan of action. But access alone will not be enough. A variety of supports must be identified and offered to ensure participation and successful outcomes. For example, many learners need to be motivated to join, re-engage, and/or persist in suitable programs. New strategies are needed to accommodate adults' multiple life, work, and family responsibilities. Learning gains will have to be measured and validated in new and nontraditional ways. And we must know if and when we reach desired educational outcomes.

- Projects should be undertaken to develop and improve:
 - Distance learning certifications for online use that can be used for college credit – in collaboration with postsecondary institutions and job training programs – including industry and/or qualification-specific certifications such as information technology;
 - Performance measures that are linked to multiple levels of certification for ICT literacy;
 - Online assessments for learning, including necessary provisions for security and validation; and
 - The framework for materials development for technology-based learning and professional development for adult education and workforce skills – i.e., a map of the greatest needs so as to improve the quality and quantity of programs and services and help ensure the most cost-effective use of funding resources and time.
- Demonstration projects should be funded to test and adapt new forms of technology-based learning.
- Government, community colleges, and others should seek to align and articulate units of successful learning online with community college credits, in a manner similar to that of President Obama's community college initiative. Federal agencies with major responsibility for adult education should take the lead in this initiative, especially the U.S. Departments of Labor, HHS, Education, and Defense.

D Meeting The Research Need

The studies discussed in this paper constitute a solid body of research. But they are a relatively small database and not a sufficient basis on which to develop ongoing policy or practice.

- The federal government should support a sustained, serious, and well-funded research, analysis, and evaluation effort – to support and inform the use of technology and distance learning for adult education and workforce skills purposes, and to enrich the national web portal on an ongoing basis.

Following are a few areas in need of attention:

- Better baseline data on adult learners and computer use.
- Evaluations of existing programs and program use. The success of technology-based self-study learning should be evaluated as it relates to specific educational outcomes – getting a GED, gaining English language proficiency, and demonstrating readiness for jobs and college. We will need to know about the kinds of technology-assisted learning adults find and use, why and how they use it, whether it is effective in achieving the outcomes they sought, and, if so, why.
- Analysis of software and learning development and designs for online learning – so that we can know more about the conditions under which successful Internet-based interactive learning takes place.
- The convergence of mobile and “just in time” learning.

National Adult Learning Technology Resource Center. To provide an operational base for the array of distance learning activities recommended above, a new National Adult Learning Technology Resource Center should be established, under the jurisdiction of the National Institute for Literacy or another appropriate interagency body. This Center should be the source of grants to support the above activities. It should operate a clearinghouse for research about technology-assisted adult learning that is not part of formal program instruction. And it should develop an informed data profile of access, use, and connectivity rates among adults, possibly including questions for the next National Assessment of Adult Learning.

E Fostering Stakeholder Involvement

If the nation is to truly transform adult education and workforce skills services for 21st century needs, and if it is to fully tap the potential of technology to take that effort to scale, federal and state government must provide incentives for the involvement of a complete range of nongovernmental stakeholder groups. To this end:

- Collaboration should be encouraged at the federal, state, and local levels among such stakeholders as nonprofit adult education and workforce skills service providers, state and local planning agencies, businesses, unions, youth policy organizations, family literacy groups, correctional institutions, school districts, community colleges, health care entities, and others.

- The National Institute for Literacy or other appropriate entity should establish an advisory committee representing the interests and needs of these groups to inform action at the national level, and states might form similar groups to inform their own planning. The goal should be to develop and promote innovative plans and programs that are responsive to state and local need, and, where appropriate, that fit the realities of local economies and business patterns, and that include active input by business.
- Corporate and funding partners have a special implementation role to play. Among other things, they should be called upon to donate equipment and/or provide grants so that low-income adults can acquire computer hardware and Internet connectivity to take advantage of distance learning opportunities. Corporations can also contribute employee time to help with various kinds of technical assistance. And because they stand to benefit from adult education for work activities, they are natural partners in developing the recommended national web portal.

V. CONCLUSION

Technology is changing the time-honored belief that adult education, as it exists today, is what “must be” to a wider understanding that learning is what “can be.” It is not a practical or even desirable option to abandon the current system. Nor is it a viable option to simply continue “fixing” this system.

Fortunately, we have the means and know-how for a substantial redirection of the national adult education and workforce skills effort with technology as our ally. Report after recent report makes it clear that we need wholesale change and that the wider and wiser use of technology can help bring about that change.

Appendix A: About the Study Director

Mary McCain, Senior Vice President of TechVision21, directed the project that resulted in this CAAL publication, *THE POWER OF TECHNOLOGY TO TRANSFORM ADULT LEARNING: Expanding Access to Adult Education & Workforce Skills Through Distance Learning*. TechVision21 is a Washington-based public policy consulting group dedicated to development and application of technology to workforce development, adult education, and other issues.

Dr. McCain earned her Ph.D. from Georgetown University. Her current clients include the Microsoft Corporation and the Center for Women and Work at Rutgers University, where she is an Affiliate Fellow. Recent clients include the National Center on Education and the Economy, the U.S. Army Education and Outreach Program, and the Center for Workforce Success of the Manufacturing Institute of the National Association of Manufacturers. She has extensive experience with other private and governmental research and policy organizations, such as the American Society for Training and Development and the National Governors Association.

Her long list of publications in the field of technology and learning include *Leapfrogging the Status Quo: E-Learning and the Challenge of Adult Literacy* (commissioned by Jobs for the Future), *E-Learning: Are We in Transition or Are We Stuck?* (for the National Association of Manufacturers Center for Workforce Success), and *America's Workforce in Crisis: Facing the Challenge for Workforce Development in the Global Economy* (Microsoft Community Affairs).

Appendix B: Professional Advisors

(* Working Group)

Bruce N. Chaloux

Director, Student Access Programs and Services
and the Electronic Campus
Southern Regional Education Board

****Forrest P. Chisman***

Senior Vice President
Council for Advancement of Adult Literacy

****John Comings***

Principal International Technical Advisor
Education Development Center
Former Director, National Center on the Study of Adult Learning and Literacy (NCSALL)

JoAnn Crandall

Professor of ESOL/Bilingual Education
Director, Ph.D. Program in Language, Literacy & Culture
University of Maryland, Baltimore County (UMBC)

****John Fleischman***

Executive Director
Outreach and Technical Assistance Network (OTAN)

Myk Garn

Director, Educational Technology
Southern Regional Education Board

****Mary Gatta***

Senior Advisor
Sloan Center on Innovative Training and Workforce Development
Department of Labor Studies and Employment Relations
Center for Women and Work, Rutgers University

Jerome Johnston

Director, Project IDEAL Support Center
Research Professor, Institute for Social Research
University of Michigan

****Cheryl D. King***

President, Kentucky Wesleyan College
Study Director, National Commission on Adult Literacy

****George Koch***

Director, Government Implementation
Advanced Distributed Learning Initiative

***Garrett Murphy**

National ABE Policy Analyst
Advisor to Council for Advancement of Adult Literacy

***Mark Musick**

Quillen Chair of Excellence in Teaching and Learning,
Claudius G. Clemmer College of Education
East Tennessee State University
Member, National Commission on Adult Literacy

***Jim Parker**

Policy and Research Associate
Council for Advancement of Adult Literacy
Formerly, Office of Vocational and Adult Education
U.S. Department of Education

Leslie Petty

Associate Director, Project IDEAL Support Center
University of Michigan

Stephen Reder

University Professor and Chair
Department of Applied Linguistics
Portland State University

David Rosen

Newsome Associates

***Heidi Silver-Pacuilla**

Research Analyst
American Institutes for Research

***Martin Simon**

Director
Social, Economic & Workforce Development Division
National Governors' Association

***Gail Spangenberg**

President
Council for Advancement of Adult Literacy
Member, National Commission on Adult Literacy

Clare Strawn

Assistant Professor
Portland State University

Laura Westberg

Director, Research/Special Projects
National Center for Family Literacy

Appendix C: Endnotes

(Note: Link functionality can vary by browser, server, and PDF version.)

¹ D. Jones and P. Kelly, *Mounting Pressures Facing the U.S. Workforce and the Increased Need for Adult Education and Literacy*. Prepared for the National Commission on Adult Literacy. Boulder, CO: National Center for Higher Education Management Systems (NCHEMS), 2007.

[<http://www.nationalcommissiononadulthoodliteracy.org/pandp.html>, Item 2].

² U.S. Census Bureau, 2006 American Community Survey (Public Use Microdata Samples); analysis for the National Commission on Adult Literacy by the National Center for Higher Education Management Systems (NCHEMS), in *Reach Higher, America*, final report of the Commission, June 2008, pp.2-3.

³ Federal adult education, training, and English language programs reach only about 3 million adults a year, including about 600,000 in the adult education programs of the Workforce Investment Act Title I (Department of Labor) adult program, dislocated worker program, Trade Adjustment Assistance, and out-of-school youth. Total state funding for adult education and literacy in 2008 is about \$1.6 billion, approximately three times the federal I grant amount; yet that number is deceptive because state appropriations vary widely: just three states – California, Florida, and New York – provide 65 percent of all state funding. *Reach Higher America*, p. 11; Appendix 6.

[<http://www.nationalcommissiononadulthoodliteracy.org>]

⁴ National Commission on Adult Literacy, op. cit., pp. vi, 24.

[<http://www.nationalcommissiononadulthoodliteracy.org>]

⁵ *Excerpts of the President's remarks in Warren, Michigan today [July 14, 2009] and a fact sheet on the American Graduation Initiative*. Office of the Press Secretary, The White House. Available from http://www.whitehouse.gov/the_press_office/Excerpts-of-the-Presidents-remarks-in-Warren-Michigan-and-fact-sheet-on-the-American-Graduation-Initiative/

⁶ US Department of Labor Bureau of Labor Statistics, *Table 1. Employment by major industry sector, 1996, 2006, and 2016*. Available at <http://www.bls.gov/emp/empmajorindustry.pdf>.

⁷ John Bynner, Steve Reder, Samantha Parsons and Clare Strawn, Research Summary: *The Digital Divide: Computer Use, Basic Skills and Employment: A Comparative Study in Portland [OR], USA and London, England*. National Research and Development Centre (NRDC), October 2008. Available from http://www.nrdc.org/publications_details.asp?ID=149.

⁸ Heidi Silver-Pacuilla, *Investigating the Language and Literacy Skills Required for Independent Online Learning*. Washington, DC. National Institute for Literacy (10/08), p. 1. Available from <http://nifl.gov/publications/pdf/NIFLOnlineLearningReport.pdf>.

⁹ Horrigan, John. *Home Broadband Adoption, June 2009*. Washington, DC: Pew Internet and American Life Project. Available from <http://www.pewinternet.org/Reports/2009/10-Home-Broadband-Adoption-2009.aspx>. Trend Data for Demographics of Internet Users, April 2009 Survey, Pew Internet and American Life Project, available from <http://www.pewinternet.org/Static-Pages/Trend-Data/Whos-Online.aspx>.

¹⁰ Partnership for 21st Century Skills, 21st Century Learning Environments, 2009, p. 3. Available at http://www.21stcenturyskills.org/index.php?option=com_content&task=view&id=600&Itemid=185.

¹¹ National Commission on Adult Literacy, *Reach Higher America*, pp. 12-13. [<http://www.nationalcommissiononadultliteracy.org>]

¹² Information Use Management Policy Institute, *Public Libraries and the Internet 2008: Study Results and Findings*, funded by the American Library Association and the Bill and Melinda Gates Foundation, pp. 1-3 and following. Available at <http://www.ii.fsu.edu/content/view/full/15153>.

¹³ NRS measures for intake/outcomes: (i) Reporting requirements include a demographic profile of each individual student who enrolls, along with contact hours and program enrollment type. Without a student record, a program cannot receive funding for students with no “intake” record. (ii) Students engaged in self-study cannot maintain a link to the accountability system, even if they come in and out of it, because they are not formally reported.

¹⁴ An excellent and extended discussion of this issue and recommendations may be found in a recent report by Tim McDonald and Ted Kolderie, *The Role of Information Technology in Creating New Kinds of American High Schools*. Washington, DC: Information Technology and Innovation Foundation, July 16, 2009, pp. 4-6. Available at <http://www.itif.org/index.php?id=263>.

¹⁵ U.S. Department of Education, Changes to NRS Guidelines for Distance Education Learners (2007). Available at <http://www.nrsweb.org/docs/foundations/NRSGuidelinesSummaryofChangesJune2007.doc>.

¹⁶ National Commission on Adult Literacy, *Reach Higher America*, p. 24. [<http://www.nationalcommissiononadultliteracy.org>]

¹⁷ The US Higher Education Act of 1998 defines “distance education” as follows: (A) IN GENERAL – Except as otherwise provided, the term “distance education” means education that uses one or more of the technologies described in subparagraph (B) – (i) to deliver instruction to students who are separated from the instructor; and (ii) to support regular and substantive interaction between the students and instructor, synchronously or asynchronously. (B) INCLUSIONS--For the purposes of subparagraph (A), the technologies used may include-- (i) the Internet; (ii) one-way and two-way transmissions through open broadcast, closed circuit, cable, microwave, broadband lines, fiber optics, satellite, or wireless communications devices; (iii) audio conferencing; or (iv) video cassettes, DVDs, and CD-ROMS, if the cassettes, DVDs, or CD-ROMS are used in a course in conjunction with any of the technologies listed in clauses (i) through (iii).

¹⁸ (1) See California Distance Learning Project at www.cdllonline.org; Project IDEAL consortium of states at www.projectideal.org; the Portland (OR) Longitudinal Study of Adult Learning at www.lsal.pdx.edu. (2) Paul Porter and Matthew Sturm, *Crossing the Great Divides: Distance learning and flexible delivery in Adult Basic Education. Research Report for Ontario’s Literacy and Basic Skills Program*. Ontario: Human Resources and Social Development Canada. AlphaPlus Centre. August 2006. Available at <http://www.distance.alphaplus.ca/pdfs/CrossingTheGreatDividesFullRpt.pdf>. (3) Human Resources and Skills Development Canada – *Getting Online: The GO Project*. Available at <http://auspace.athabasca.ca:8080/dspace/handle/2149/2115>. (4) Roslin Brennan, *One size doesn’t fit all: Pedagogy in the online environment – Volume 1*. National Vocational and Educational Training System (NCVER), Australian Flexible Learning Framework, 2003. Available at

http://www.eric.ed.gov:80/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&&ERICExtSearch_SearchValue_0=ED476928&ERICExtSearch_SearchType_0=no&accno=ED476928.

¹⁹ Stephen Reder & Clare Strawn, *Self-Study: Broadening the Concepts of Participation and Program Support*, *Focus on Basics*, Vol. 8, Issue C, 11/06, pp. 6-10. National Center for the Study of Adult Literacy. Available at <http://www.ncsall.net/?id=1152>.

²⁰(1) Richard Stiles and Dennis Porter, *The California Adult Education 2005-2007 Innovation and Alternative Instructional Delivery Program: A Review*. California State University Dominguez Hills College of Extended and International Education, 2007. <http://www.cdlponline.org/pdf/InnovationProgramsReport2005-2007.pdf>; (2) Stephen Reder and Clare Strawn, *Self-Study: Broadening the Concepts of Participation and Program Support*, *Focus on Basics*, Vol. 8, Issue C, 11/06, pp. 6-10. National Center for the Study of Adult Literacy. Found at www.ncsall.edu. (3) Barbara Means; Yukie Toyama; Robert Murphy; Marianne Bakia and Karla Jones, *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*. U.S. Department of Education, Office of Planning, Evaluation, and Policy Development, Policy and Program Studies Service, Center for Technology in Learning, 2009. Available at <http://www.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf>.

²¹ Barbara Means, et.al., op.cit.; Richard Stiles and Dennis Porter, op.cit., Paul Porter and Matthew Sturm, *Crossing the Great Divides: Distance learning and flexible delivery in Adult Basic Education. Research Report for Ontario's Literacy and Basic Skills Program*. Ontario: Human Resources and Social Development Canada (2006). [<http://distance.alphaplus.ca>]

²² *A Success Story in Ohio, Distance in Action, Project IDEAL, 2007*. Available at http://www.projectideal.org/distance_in_action/action_1.html. Examples include online videos of "master" teachers using technology in adult learning classes in all subjects at all levels (www.mlots.org); Moodle that provides a platform for developing and tracking student learning (<http://www.moodle.org>); the Pennsylvania online adult education website (<http://www.able.state.pa.us/able/cwp/view.asp?a=7&Q=42479&g=177&ableNav=|2842|3104|&ableNav=|3100|&ableNav=|2760|3100|>); and wikis for online adult education, such as http://wiki.literacytent.org/index.php/Adult_Literacy_Professional_Development and <http://aalpdresources.pbworks.com/>.

²³ Drawn from analysis done by the National Commission on Adult Literacy.

²⁴ Significant work on persistence in community college ESL programs can be found at the website of the Council for Advancement of Adult Literacy, www.caalusa.org.

²⁵ Richard Stiles and Dennis Porter, *The California Adult Education 2005-2007 Innovation and Alternative Instructional Delivery Program: A Review*. California State University Dominguez Hills College of Extended and International Education, 2007. <http://www.cdlponline.org/pdf/InnovationProgramsReport2005-2007.pdf>

²⁶ John P. Comings, "Student Persistence in Adult Literacy and Numeracy Programs, p. 173 in Stephen Reder and John Bynner, eds., *Tracking Adult Literacy and Numeracy Skills: Findings from Longitudinal Research*. New York: Routledge, 2009.

²⁷ See Section III for a description of this study.

²⁸ Reder and Strawn, op. cit., pp. 6-8.

²⁹ See details of programs in Ohio, Pennsylvania, North Carolina, and Missouri on the Project IDEAL website: www.projectideal.org/distance_in_action/index.html and www.projectideal.org/publications_resources/research_reports.html

³⁰ Information Use Management and Policy Institute, op. cit., pp. 1-3. The US Census routinely, but not annually, asks access questions on its household surveys. Its most recent survey data for Internet access is from 2007 and finds that 61.7 percent of households report access. The 2007 survey did not ask a question about computer access, the most recent year for that question being 2003. U.S. Census Bureau, *Computer and Internet Use in the United States: October 2007, Tables 1-5*. Available at www.census.gov/population/www/socdemo/computer.html.

³¹ Information Use Management and Policy Institute, op. cit., pp. 1-3.

³² Kennedy, Tracy L. M.; Smith, Aaron; Wells, Amy Tracy and Wellman, Barry, *Networked Families*, Pew Internet and American Life Project, October 19, 2008. Available from <http://www.pewinternet.org/Reports/2008/Networked-Families.aspx>. The Marist Institute for Public Opinion Poll conducted in March of 2009 found a slightly higher percentage - 87 percent - of US residents who have a cell phone. Those with annual incomes less than \$50,000/year dropped to 82 percent. Available at www.marketingcharts.com/interactive/employment-age-top-factors-in-cell-phone-pda-use-9678/

³³ Trend Data for Demographics of Internet Users, April 2009 Survey, Pew Internet and American Life Project, available from <http://www.pewinternet.org/Static-Pages/Trend-Data/Whos-Online.aspx>.

³⁴ Horrigan, John. *Home Broadband Adoption, June 2009*. Washington, DC: Pew Internet and American Life Project. Available from <http://www.pewinternet.org/Reports/2009/10-Home-Broadband-Adoption-2009.aspx>.

³⁵ Most adults born before 1968 learn computer skills informally or at work, while younger users are taught in school. Participants of adult education programs were not more likely to be computer users than non-participants. All users prefer to continue to learn new computer skills through trial and error and with help from friends and family. Clare Strawn, *The Relationship Between Literacy Proficiency and the Digital Divide Among Adults With Low Education Attainment, 2008*. Available from <http://www.lsal.pdx.edu/Documents/PDF/littech.pdf>. Also see analysis of data from 2006 UK survey, *Adult Learning @ Home* by N. Selwyn, S. Gorard, and J. Furlong, *Adult learning in the Digital Age*, London, 2006, cited in Heidi Silver-Pacuilla, op. cit., pp. 9-10.

³⁶ Adult learners across the literacy and language spectrum show strong motivation to gain computer literacy skills, perceived as key to work advancement, Silver-Pacuilla, op. cit. pp. 3-6; as was found in the comparative study between Portland and London, described previously, the relationship of ICT to employment is one of great significance for many adults, and is often part of the reason they are doing these courses.

³⁷ John Bynner, Steve Reder, Samantha Parsons and Clare Strawn, Research Summary: *The Digital Divide: Computer Use, Basic Skills and Employment: A Comparative Study in Portland [OR], USA and London, England*. October 2008. http://www.nrdc.org.uk/publications_details.asp?ID=149, Ibid, pp. 3-6.

³⁸ Heidi Silver-Pacuilla, op.cit, pp. 7-8.

³⁹ Harvey Mellar, Maria Kambouri, Kit Logan, Sally Betts, Barbara Nance and Viv Moriarty, *Effective Teaching and Learning Using ICT*, Summary Report, NRDC, February 2007. Available from http://www.nrdc.org.uk/publications_details.asp?ID=87#. Heidi Silver-Pacuilla, p. 13.

⁴⁰ Clare Strawn, *The Relationship Between Literacy Proficiency and the Digital Divide Among Adults With Low Education Attainment: A technical report from the Longitudinal Study of Adult Learning, Portland State University*, 2008. Available from www.lsal.pdx.edu/Documents/PDF/littech.pdf, p. i.

⁴¹ Stephen Reder, *Giving Literacy Away, Again: New Concepts of Promising Practice*, in Summaries of Papers Presented at Twentieth Annual Rutgers Invitational Symposium on Education (RISE), co-sponsored by National Center for the Study of Adult Learning and Literacy (NCSALL), Institute for the Study of Adult Literacy of Penn State University, and Rutgers Graduate School of Education (October 23-24, 2003), pp. 21-22. Available at http://www.ncsall.net/fileadmin/resources/research/rise_summaries.pdf.

⁴² Stiles, Richard; Porter, Dennis. *The California Adult Education 2005-2007 Innovation and Alternative Instructional Delivery Program: A Review*. California State University Dominguez Hills College of Extended and International Education, 2007, pp. 1-3. Available from <http://www.cdiponline.org/pdf/InnovationProgramsReport2005-2007.pdf>.

⁴³ Ibid

⁴⁴ Ibid

⁴⁵ Stephen Reder & Clare Strawn, *Self-Study: Broadening the Concepts of Participation and Program Support, Focus on Basics*, Vol. 8, Issue C, 11/06, pp. 6-10. National Center for the Study of Adult Literacy. Available at <http://www.ncsall.net/?id=1152>.

⁴⁶ Clare Strawn, *The Relationship Between Literacy Proficiency and the Digital Divide Among Adults With Low Education Attainment: A technical report from the Longitudinal Study of Adult Learning, Portland State University*, 2008. Available at <http://www.lsal.pdx.edu/reports.html>.

⁴⁷ Ibid, p. 4.

⁴⁸ Stiles, R. & Porter, D. (2006). *The California Adult Education 2004-2006 Innovation and Alternative Instructional Delivery Program: A review*. Carson, CA: California State University Dominquez Hills College of Extended and International Education. <http://www.cdiponline.org/pdf/InnovationProgramsReport2004-2006.pdf>.

⁴⁹ Petty, L., Shafer, D., & Johnston, J. (2004). *Beyond the classroom: Six states develop distance programs for adult learners*. Project IDEAL Support Center, Institute for Social Research, University of

Michigan, Ann Arbor, MI.

<http://www.projectideal.org/pdf/WorkingPapers/WP6StateDistancePrograms2004.pdf>.

⁵⁰ A Success Story in Ohio, *Distance in Action*, Project IDEAL, 2007. Available at http://www.projectideal.org/distance_in_action/action_1.html.

⁵¹ Johnston, J. & Petty, L. *Distance Education – Expanding Options in Adult Education* (under review). Project IDEAL Support Center, Institute for Social Research, University of Michigan, Ann Arbor, MI, cited in Johnston, J. ., *A Better Educated Citizenry: Increasing Adult Literacy through Distance Education*. Project IDEAL internal paper provided by author.

⁵² Project IDEAL Student Satisfaction Survey, unpublished data, cited in Johnston, *A Better Education Citizenry: Increasing Adult Literacy through Distance Education*, Project IDEAL Internal paper provided by author.

⁵³ Petty, L. ., Shafer, D., & Johnston, J., *Beyond the classroom: Six states develop distance programs for adult learners*. Project IDEAL Support Center, Institute for Social Research, University of Michigan, Ann Arbor, MI.

⁵⁴ John Bynner, Steve Reder, Samantha Parsons and Clare Strawn, Research Summary: *The Digital Divide: Computer Use, Basic Skills and Employment: A Comparative Study in Portland [OR], USA and London, England*. October 2008. http://www.nrdc.org.uk/publications_details.asp?ID=149.

⁵⁵ Ibid, pp. 3-6.

⁵⁶ Harvey Mellor, Maria Kambouri, Kit Logan, Sally Betts, Barbara Nance and Viv Moriarty, *Effective Teaching and Learning Using ICT*, Summary Report, NRDC, February 2007, pp. 6-8. Available from http://www.nrdc.org.uk/publications_details.asp?ID=87.

⁵⁷ Heidi Silver-Pacuilla, *Investigating the Language and Literacy Skills Required for Independent Online Learning*. Washington, DC. National Institute for Literacy (October, 2008), p.1. <http://www.nifl.gov/publications/pdf/NIFLOnlineLearningReport.pdf>.

⁵⁸ Ibid, p. 8.

⁵⁹ Ibid, p. 7-8.

⁶⁰ Means, Barbara; Toyama, Yukie; Murphy, Robert; Bakia, Marianne; Jones, Karla. *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*. U.S. Department of Education, Office of Planning, Evaluation, and Policy Development, Center for Technology in Learning, 2009. Available at <http://www.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf>.

Appendix D: Tools of Technology

(Note: Link functionality can vary by browser, server, and PDF version.)

TYPES OF TECHNOLOGIES/TOOLS	EXAMPLES
<i>THE FOLLOWING DEVICES CAN BE USED <u>WITHOUT INTERNET ACCESS</u></i>	
LEARNING BY VIEWING AND/OR LISTENING + SUPPLEMENTARY PRINT MATERIALS	
<p>Television and Video [early ones not available online] typically are supported by print materials that accompany the segments and/or lessons that are viewed. Communication, if appropriate, is by mail and/or telephone. These media are useful because they can present information in context and with a purpose, whether learning how to locate assistance within a community or perform tasks at work. Video has an advantage in that it may be paused and re-played, enabling the learner to take notes, review the information and view/listen to as often as necessary. The disadvantage is that these media are “one-way” and do not allow for interaction.</p>	<ul style="list-style-type: none"> • Indiana GED on TV Series of 39 half-hour <i>GED Connection</i> TV programs on Indiana (PBS) channels & cable. Learners call toll-free telephone number to enroll; receive books by UPS. • TV411 - http://www.tv411.org TV series and Videos (DVD/VHS). Half hour episodes that correlate with a colorful magazine-style workbook. Curriculum support for teachers.
<p>Radio and MP3 Players/iPods Being able to hear others speak is particularly useful to language learners, in terms of using the correct accent and understanding how words are used in different contexts. MP3 Players/iPods increasingly are used for mobile learning, with purpose-developed lessons and with information available for download from “libraries”.</p>	<p>Podcasts (audio blogs) are “audio recordings, usually in MP3 format, of talks, interviews and lectures, which can be played either on a desktop computer or on a wide range of handheld MP3 devices [such as iPODs].”</p>
<p>Landline and/or Mobile Phone: Calling connection enables communication with teacher/instructor/guide for learning support. Mobile phone also enables communication with friends, family and/or colleagues for information, advice, instructions, other interests.</p>	
COMPUTER-AIDED INSTRUCTION (CAI)	
<p>DVD/CD-ROMs</p> <ul style="list-style-type: none"> – Typically designed for use with teacher/instructor, either in classroom or at a distance; although some also are accessible to a learner for independent use, with online teacher support. Videos usually offer learning within real-life contexts, with supplemental materials that support the lessons. – For English language learners, video has the added benefit of providing real language and cultural information. Video can be controlled (stopped, paused, repeated). It allows learners to see facial expressions and body language at the same time they hear the stress, intonation, and rhythm of the language. 	<ul style="list-style-type: none"> • Crossroads Café—intermediate ESL video - http://www.intelecom.org/course_info.asp?id=10 • English for All—high beginning ESL video, DVD, Internet - http://www.myefa.org • GED Connection video and DVD with supplemental print materials - http://litlink.ket.org
<p>Assistive Technologies: Initially developed to enable individuals with disabilities to access and use technologies, a number of these technologies can provide useful options for use of technology in learning for adults who have not yet mastered the functions of a computer and/or language or reading.</p>	<p>The use of touch screen instead of a keyboard has migrated to the high-end technology market. Other options in use are computers that provide “text to speech” and “speech to text”.</p>

<p>THE FOLLOWING TOOLS AND PROGRAMS ARE AVAILABLE VIA <u>INTERNET CONNECTION ONLY</u></p>	<p>Adult Learning</p>
<p>LEARNING BY VIEWING, LISTENING AND/OR COMMUNICATING</p>	
<p>Video online: Has the same capabilities and use as standalone video, with the valuable option of enabling the individual to interact in various ways – Q/A, simultaneous presentations/discussion with others – during the video. Developing video for online access also can be significantly less expensive than developing it for a CD-ROM/DVD, with minimal to no cost to the viewer and the potential for wide and immediate audience reach.</p>	<p>• English for All - http://www.myefa.org</p>
<p>Internet telephony/Voice Over Internet Protocol (VOIP) Potential for 24/7/365 worldwide voice and/or video of other parties. Tutoring and/or technology support for learning.</p>	<ul style="list-style-type: none"> • Skype • Gizmoproject
<p>Smart Phones and Personal Digital Assistants (PDA): Wireless phones with advanced data features, including email and/or access to the Internet.</p>	<ul style="list-style-type: none"> • Blackberry • Palm
<p>E-mail/List Serves; Real-time Texting/chat ; Video-conferencing; Web-conferencing; Webinars (reusable lectures/fishbowl seminars) Provides real-time opportunities for Q&A with individuals at a distance, either by pre-arrangement or on the moment. Most of these communications may be sorted and archived by the user.</p>	<ul style="list-style-type: none"> • OfficeZilla • Google Groups, Yahoo Groups
<p>Twitter www.twitter.com - Hybrid instant messaging/blogging tool that enables users to build networks by following and being followed by others on Twitter. Messages (tweets) are limited to 140 characters requiring a concise structure. Twitter can be useful as a communication tool between teachers/tutors and students, as well as an option to read “on the spot” information about people and activities as part of a learning process.</p>	
<p>LEARNING VIA USER-GENERATED CONTENT AND COMMUNICATION: WEB 2.0</p>	
<p>Blogs (short for Web logs) are Web pages consisting of regular entries of commentary, descriptions of events, or other material, such as graphics or video that focuses on particular topics.</p>	
<p>Wikis are collections of web pages designed to enable anyone who accesses them to contribute or modify content, using a simplified markup language. Wikis are often used to create collaborative websites and to power community websites.</p>	<p>http://wiki.literacytent.org/index.php/Adult Literacy Professional Development; and http://aalpdresources.pbworks.com/</p>
<p>Social Networks and Communities of Practice: Provides a means by which any/all individuals can develop and/or find others who are part of the same professional, personal, industry, neighborhood, certification, and any other large or small defining aspect for a “community” or “network.” For learning, whether at work, home, community, etc. such networks provide access to knowledge, experience, advice, discussion and other.</p>	

<p>Mashups are applications that combine data from two or more sources to create something more valuable than the sum of their parts, such as service that combines Google maps with real estate listings.</p>	
<p>LEARNING VIA WEB PORTALS WEBSITES/PORTALS LEARNING VIA ACCESS TO INFORMATION</p>	
<p>Self-Contained Learning Centers: Provide a coherent experience to an unassisted user, typically offering a planned curriculum, perhaps gathering an initial assessment of user skill level, and offering lessons developed specifically for the given site. An effective self-directed literacy website can assess the user’s ability to operate in the environment, and if the user is not ready yet, will provide basic instruction on how to actually use the site.</p>	<ul style="list-style-type: none"> • Learner Web - www.learnerweb.org Free Internet “learning support system” that consists of a Web-based software system that is implemented regionally; organized around Learning Plans - steps structured around achieving an identified goal. Learner creates a personal profile, chooses a goal from the available list and follows the learning plan independently or with a tutor or a teacher.
<p>Web Applications Web applications are differentiated from websites in that they are task-oriented and supply the user with a rich set of controls and objects to create, edit, and store information.</p> <p>A literacy web application translates curriculum to the medium of the web and provides web-based, on-line instruction that makes full use of text, audio, photo art, music, graphics, icons, video clips, and animation, to actively engage the mind and imagination of adult learners and guide them through an effective student-centered, self-study, instructional experience.</p> <p>It takes advantage of the interactive capabilities of technologies like Flash that allow users to navigate through virtual space, move objects on the screen, and enter data or answers and obtain immediate feedback.</p>	<ul style="list-style-type: none"> • USA Learns - www.usalearns.org Free Web portal designed for adults learning English. USA Learns was designed to serve learners at a distance, not for use in school or agency computer labs. Curricula for three different English proficiency levels; lessons are introduced with brief videos followed by a list of new words. Depending on the level, words are introduced with pictures, audio, video, or written definitions, followed by quizzes. Embedded in the lessons are relevant life skills, such as finding a job, renting a place to live.
<p>Resource Collections - Sites that primarily maintain links to other websites that offer some instructional content or activities. Links are grouped by topic (e.g., “algebra, “reading comprehension”). The sites to which links are maintained are often discipline-specific- e.g., “math.com.”</p>	<ul style="list-style-type: none"> • LiteracyLink Online: Site that provides adults options to develop their work-readiness skills in units on employment strategies for finding and keeping a good job, communicating, reading, and math; preparation and online practice tests for the GED exam, etc. - http://www.ketadultlearning.org/litlink/online.htm • The Beehive – http://www.thebeehive.org
<p>Virtual Reality (VR). Allows a user to interact with a <u>computer-simulated</u> environment, whether real or imagined. <u>Current virtual reality environments</u> are primarily visual experiences displayed either on a <u>computer screen</u> or through special <u>stereoscopic displays</u>, but some include sound through speakers or <u>headphones</u> (e.g., Second Life).</p>	

MANAGEMENT TOOLS	
<i>Instructional learning systems (ILS); Learning management systems (LMS), Learning content management systems (LCMS),</i>	
Moodle is an Open Source Course Management System (CMS), also known as a Learning Management System (LMS) or a Virtual Learning Environment (VLE). It has become very popular among educators around the world as a tool for creating online dynamic websites for their students. Moodle can scale to very large deployments and hundreds of thousands of students, yet it can also be used for a primary school or an education hobbyist. Many institutions use it as platform to conduct fully online courses or simply to augment face-to-face courses.	
PIMS - The Pennsylvania Information Management System is a statewide longitudinal data system to efficiently and accurately manage, analyze, disaggregate and use individual student data for each student served by Pennsylvania's Pre K -12 public education system.	
HTTrack is a free software and an easy-to-use offline browser utility. http://www.httrack.com/html/overview.html . It allows you to download a World Wide website from the Internet to a local directory, building recursively all directories, getting html, images, and other files from the server to your computer.	
TOPSpro is a computerized database system designed for students, teachers, and program administrators in adult education. Automates CASAS scoring, collects student demographic data, tracks student progress, generates reports and profiles, and manages data for state and federal accountability. https://www.casas.org/home/index.cfm?fuseaction=home.showContent&MapID=125	
<i>Authoring Tools & Content Management</i>	
SCORM , the Shareable Content Object Reference Model, shows what kinds of services will be needed to solve a particular problem, how they can be put together, the relevant standards that apply, and how they might be used. Benefits to adopting SCORM include -- <u>Accessibility</u> : The ability to locate and access instructional components from multiple locations and delivery them to other locations. <u>Interoperability</u> : The ability to take instructional components delivered in one system and use them in another system. <u>Durability</u> : The ability to withstand technology evolution and/or changes without costly redesign, reconfiguration, or recoding. <u>Reusability</u> : The flexibility to incorporate instructional components in multiple applications and contexts. For example, e-learning content designed for one organization can be redeployed, rearranged, repurposed, or rewritten by other organizations with similar learning needs. http://www.adlnet.gov/Technologies/scorm/default.aspx	

The ability of a network to coordinate and communicate with other networks, such as two systems based on different protocols or technologies.

CNRI Digital Object Registry Corporation for National Research Initiatives – general-purpose digital object registry for download, installation, and use by any organization or community. Objects are registered with their metadata and that metadata is indexed and made searchable. Making each such registry a specialized index over a collection of digital material in one or more repositories. - <http://www.doregistry.org>

Appendix E: Selected Programs and State Models

[Summaries are taken largely from websites and public reports.

More information is available from the URLs indicated.]

(Note: Link functionality can vary by browser, server, and PDF version.)

PROGRAM MODELS

The program models that follow have been chosen to represent the variety of ways technology can support learning and other activities for adults and for practitioners and program managers. Some are typical online curriculum programs; others are newly developed programs still being tested.

Most of the programs were funded by government and foundations. Each is based on generally accepted principles of effective adult learning and learning using technology. A few are technology-assisted programs developed and marketed by for-profit companies, largely because the market is diffuse, small (in terms of organizations that buy products), and lacking financial resources to justify for-profit sales. As technology becomes more widely available and more individuals are familiar with its use, and as programs and learning applications expand, current divisions between education levels – K-12, postsecondary, adult education and training – may begin to blur, providing the necessary market for products aimed at low-literacy and ESL adult learners.

Interactive Learning Using Multiple Media

- **Sed de Saber™ (Thirst for Knowledge)**
<http://www.seddesaber.com>

Sed de Saber is an electronic English language program for Hispanic adults who have limited English proficiency. It is a portable, interactive, self-paced program that uses storytelling, voice recording, games, and review exercises to build and improve English language skills. Sed de Saber combines ESL curriculum with the Leapfrog Quantum Pad Plus Microphone™, which allows the learner to record, playback, and compare his/her voice to the word or phrase being learned, increasing confidence in pronunciation skills. Marriott International has used Sed de Saber for many of its Hispanic employees for whom English is a second language since 2006.

Online Work-Related Training

- **Workplace Essential Skills (WES)**
<http://litlink.ket.org/wesged.aspl>

WES uses TV/videos, print, and the Internet to help individuals improve reading, writing, math, and job skills. The lessons are written at a pre-GED level, designed to help build critical thinking and problem solving skills that can help with finding a job and/or preparing for the GED. There are 24 half-hour programs (plus Orientation), four workbooks, and 24 free online lessons. They are designed to work together to make learning easier. An individual can register and save work in an online portfolio, as well as choose to work online with a teacher. The programs may be viewed on public television stations,

online, or using a standalone CD ROM. Workplace Essential Skills is correlated to widely used national assessment tools and to each other.

WES was developed in 1996 through a partnership among the PBS Adult Learning Service, the National Center on Adult Literacy at the University of Pennsylvania, Kentucky Educational Television, and the Kentucky Department of Education.

- **Penn State Online Postbaccalaureate Certificate in Family Literacy**
<http://www.worldcampus.psu.edu/FamilyLiteracyCertificate.shtml>

The 15-credit family literacy post-baccalaureate certificate was developed to provide educators with an opportunity to enhance their skills and credentials in the discipline of literacy instruction. To meet the wide range of needs for literary professionals, the online certificate program in family literacy has tracks in children's education, adult literacy, and parental involvement. Students taking the program at the post-baccalaureate level can apply course work to undergraduate and master's degree programs. Each course is taught using a blend of Web and e-mail to maximize flexibility, while maintaining teacher and student interaction. The certificate curriculum was created in partnership between the Goodling Institute for Research in Family Literacy at Penn State and the National Center for Family Literacy.

❑ Web Portal and Online Learning Environment for Adult Learners in Basic Education:

- **AlphaRoute [Canada]**
<http://www.alpharoute.org>

AlphaRoute, developed by the Literacy and Basic Skills (LBS) program of Ontario, Canada, is a password-protected web-based learning environment for adults who want to improve their reading, writing, math, and computer skills to achieve their goals. Alpharoute targets adult literacy students who want to learn online and offers: ongoing mentor support from trained LBS and ABE program practitioners, learning opportunities which complement and reflect learning goal areas expressed by adult literacy students, and an online community for adult literacy students to learn online together within a password-protected learning environment.

Specific features include: interactive learning activities developed specifically for adult learners; learning management tools with personalized training plans, activity lists, portfolios, and learning tools such as personalized notepads and word lists; easy-to-use communication tools such as email, discussion groups, and chat; special content areas for workforce literacy, numeracy and technology, self-assessment, Internet search skills, and useful web links.

- **The Learner Web**
www.learnerweb.org

The Learner Web (LW) is a free Web- and telephone-accessed application that provides customized, guided instructional support to adults seeking to improve their basic skills, prepare for the GED, or pursue other learning goals such as citizenship, family literacy, or college prep. The LW makes resources accessible to learners on their own time and in their own environment. A learner's goals and skill needs are matched to supporting resources available online or offline in the local community. In addition to on-line resources, the Learner Web integrates support services from existing local education programs, community based organizations, tutors, and telephone helpers. The Learner Web consists of a Web-

based software system that is implemented regionally. The Learner Web has begun the second year of a three-year demonstration project in seven demonstration regions across the country.

❏ Online Communities

- **Adult Literacy Education (ALE) Wiki!**
http://wiki.literacytent.org/index.php/Main_Page

The ALE Wiki is a free, online community of practice for teachers, tutors, administrators, practitioners, researchers, adult learners, and others who are interested in the connections between research, professional knowledge, and practice in adult basic education, adult secondary education, and English language learning. Like other wikis, this is a text environment where one can read what others have written but also easily contribute one's own knowledge, opinions, findings, and observations. The ALE Wiki includes discussions and resources on a number of topics ranging from adult basic literacy, to assessment, workforce and workplace education, and public policy. In the topical areas are selected discussions that have taken place on electronic lists, summaries of these discussions, links to relevant research, research citations, bibliographies, glossaries of terms, and other resources. This wiki was created in November 2004.

- **The Ohio Literacy Network (OLN) Website:**
<http://www.ohioliteracynetwork.org/about.html>

The Ohio Literacy Network (OLN) was established in 1987 to promote awareness of adult literacy issues and needs; to serve as a clearinghouse for the exchange of literacy information; and to encourage collaborative literacy efforts. The OLN is a membership organization, funded by public and private government grants, donations, and membership dues. Its services include:

- A statewide *LearnLine* which provides access to free learning tools on television, through the Internet, at home and in the local community.
- A statewide GED Connection project with home and Internet based access to GED preparation tools.
- The Literacy Ohio Online Learning Site with learning tools and connections to local education programs and resources.
- A statewide network of collaborative projects.
- A statewide directory of literacy service providers.
- Public awareness and marketing initiatives to recruit potential students and volunteers.

The OLN has partnered across Ohio with Time Warner Cable, Kentucky Educational Television, Ohio's eight PBS stations and The Ohio Community Computer Network to stream, broadcast, and provide a wide variety of Distance Learning opportunities.

- **Alpharoute Café**
<http://resources.alpharoute.org/pdfs/ARCafe.pdf>

One of the goals of the Café is to give learners a place where they direct their own learning. They are free to explore discussions, activities, and games that interest them and through the support and

encouragement of mentors, facilitators, and other learners they can feel connected to a larger community through the use of these tools. The Café was launched in September 2003. The Café features a number of interactive tools that learners can choose, including a chat room, themed discussions, interactive games, and a monthly Cyber Search activity. (Note: The Alpharoute Café is part of AlphaRoute outlined above.)

❏ Web-based Resource Collections

- **PBS Literacy Link**
<http://litlink.ket.org/>

LiteracyLink's goal is to provide a link for underserved and hard-to-reach adults and their teachers to quality adult basic education and GED preparation. Combining video, the Internet, and print materials, LiteracyLink programs are relevant to the needs of the individual learner, adult instructional programs, and the workforce. A joint project of PBS Adult Learning Service, the National Center on Adult Literacy of the University of Pennsylvania, Kentucky Educational Television, and the Kentucky Department of Education, it began in July 1996. Series are now available to more than 87% of American households through public television [broadcasts](#). Programs include: *GED Connection (Learners preparing for the GED exam)*, *Workplace Essential Skills (Adults looking for jobs or looking for better jobs)*, *Project CONNECT (website where adults in adult education classes can practice English skills and learn about working, studying and living in the US)*.

- **Workforce Online Learning Information Portal (WOLIP)**
<http://wolip.sreb.org/>

From WOLIP, individuals can search online training opportunities in the priority areas targeted by their state. A variety of other learning opportunities are also available from this site. Each of the four WOLIP states (Colorado, Maine, Mississippi, and Pennsylvania) has defined their priority workforce training needs, selected online courses and programs they will make available, selected and certified the institutions/providers of the courses/programs, determined student eligibility and participation requirements, and established procedures for enrollment and financial assistance.

WOLIP is sponsored by the Alfred P. Sloan Foundation in cooperation with the U.S. Department of Labor, Pennsylvania State University, and the four partner states, with assistance from the Southern Regional Education Board.

❏ Web Applications

- **USA Learns**
www.usalearns.org

USA Learns is a free ESL instructional program developed primarily for immigrant adults with limited English language skills who cannot attend traditional classroom programs because of difficulty with schedules, transportation, or other barriers. The site offers practice activities in listening, reading, writing, and speaking skills as well as life skills necessary for success at work and in the community. All instructional materials are online; there are no videos, workbooks, or other materials for printing. USA

Learns is designed primarily for individual distance learning outside of the traditional classroom. The USA Learns website consists of three distinct programs, each derived from English For All (www.myefa.org):

- First English Course – 20 video-based, beginner-level units
- Second English Course – 17 video-based, intermediate-level units
- Practice English and Reading – 42 intermediate-level stories and activities

Learners do not need advanced computer skills to use USA Learns. The program is designed primarily for individual distance learning outside of the traditional classroom. But a tutor or teacher can use the website's learning management system to create an online class and support one or more students in their studies. The learning management system enables educators to view students' work and provide feedback online. USA Learns was developed by the Sacramento County Office of Education (SCOE) in conjunction with the University of Michigan and Project IDEAL as part of a larger project on technology innovations and distance learning for adult education.

- **BuildingSkills4Work**
(see email links below)

BuildingSkills4Work aims to equip out-of-school adults and youth with the workforce skills that will prepare them to qualify for and be successful in higher paying entry-level jobs. This free online program is designed to engage adult learners and to be used successfully both in formal instructional settings and by learners without the intervention of a teacher or tutor or enrollment in a formal program. It teaches the workplace skills that employers seek in new hires, including both academic and interpersonal skills. The web application can be targeted on the needs of individuals at the low to middle end of the NAAL Basic Literacy skill (Level 2) range, people whose reading and quantitative skills are often not sufficient to successfully complete a GED program or apprenticeship, to matriculate in community college or university degree programs, or to qualify for jobs that pay self-sufficiency wages.

Three organizations – the Center for Women and Work at Rutgers University (which has extensive experience working with states to implement Internet learning for low-skill workers), the Center for Literacy Studies at the University of Tennessee (which manages Equipped for the Future), and R & D Media Solutions SF (a San Francisco media and web development organization) – have developed this web application to meet the work readiness needs of low-skilled adults. BuildingSkills4Work will be available at no cost to learners, adult education teachers, workforce skills trainers, and the general literacy community. The website was demonstrated in webinars in May and June 2009 and is being beta-tested around the country. It will be launched late in 2009 and add additional content in 2010. For further information, please contact Heather McKay of the Center for Women and Work (hmckay@rci.rutgers.edu); Diane Gardner of the Center for Literacy Studies (dgardner@utk.edu); or Richard Appelbaum of R&D Media Solutions SF (RichardA@RnDMediaSF.com).

STATE MODELS

Many states have developed and implemented distance education programs and pilots for adult education and ESL. In general, although these programs have provided useful lessons and experience and significant degrees of success, they remain on the “demonstration” level, serving relatively few adults. If distance learning is to go to scale, states and regions must address the policy, regulatory,

funding, and program structure issues that inhibit expansion of distance education. Two states that began this process some years ago are California and Pennsylvania.

❑ CALIFORNIA

<http://www.cdiponline.org/index.cfm?fuseaction=whatis&pg=4>

In 1993 the California legislature passed EC 52522 permitting the Superintendent of Public Instruction to approve adult school plans to spend up to five percent of their block entitlement on innovation and alternative instructional delivery. This authorization and the subsequent initiative are commonly known as the Innovation Program initiative.

The Innovation Program initiative was launched in 1995, and until recent budget cuts affected the program, almost all the approved innovative programs have fallen under the California Distance Learning Project's definition of distance learning. Any adult school wishing to request authorization for the innovative programming submitted an annual application to the California Department of Education. Video and audio checkout programs were the most common delivery modalities followed by online instruction.

The state provided a dedicated funding stream for distance education and thus enabled longitudinal evaluations, experience with practice, awareness of the challenges faced by educators, managers, learners and others. Funding was provided for collecting and assessing data across these programs, serving up to 60,000 adults by 2005, and outcomes are therefore available for 2005-2008. The state's use of a common assessment system – the Comprehensive Adult Student Assessment Systems, CASAS – enabled comparisons across the system. Findings, details of which are in Section III, included the success of “blended learning” both for successful completion and persistence.

Unfortunately, the economic environment in the state of California in 2009 resulted in cuts in education across the board and moved authority for adult education funding from the California Department of Education to Local Education Agencies (LEA). LEAs can use those previously restricted adult education funds for whatever purpose they deem appropriate. There is no more attendance reporting and no more program monitoring. Some smaller adult education agencies are closing shop, while others are radically modifying their range and scope of offerings.

❑ PENNSYLVANIA

<http://www.able.state.pa.us/able/cwp/view.asp?a=7&q=117134>

After several years of experimenting with delivering distance education via local agencies, Pennsylvania chose to pilot a different approach. Agencies could continue to offer distance education to their learners, but they would not receive special funds for doing so. The state would provide, at no cost to the agency, training, technical assistance, and workbooks for both *GEDC* and *WES* distance learners. Alternatively, agencies could choose to refer their students interested in distance learning to a centralized agency, the Centralized Distance Teaching Services (CDTS), coordinated by the Tuscarora Intermediate Unit (TIU). Both the referring agency and the TIU would receive credit for serving the student.

Pennsylvania's initiative provided a model for centralizing adult distance education that avoided penalizing individual agencies and that provided teacher support outside of the existing program

instruction pool. Pennsylvania maintains a substantial database of curriculum and professional development resources.

For the 2004 – 2005 academic years, the Centralized Distance Teaching Services employed 10 distance teachers. Distance teachers are required to participate in bi-monthly conference calls and attend annual training. The number of students assigned to a teacher is based on the number of students a teacher feels comfortable serving, given their other job demands; for 2004 – 2005, teachers supported from seven to 23 active students.

Appendix F: Bibliography

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- Lynn Parr Bartlett, Karen Norton, Dennis Porter, et. al., *Distance Learning for the Adult Learner: Improving Persistence and Effectiveness* (Fall 2006)
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Project IDEAL:

Numerous articles and books have come out of the Project IDEAL work, including the comprehensive *Handbook of distance Education for Adult Learners* (2004) and a series of working papers:

- [The Missouri Distance Learning Mentoring Program. An Evaluation Prepared by The Project IDEAL Support Center](#) (2005)
- Shannon Young, [Exploring Distance Education Curricula for Adult Learners](#) (2005)
- Jerome Johnston, [Measuring Contact Hours and Educational Progress in Distance Education](#) (2005)
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Website Resources

- Adult Ed Online - www.adultedonline.org
- Association of Public Television Stations - Workforce Skills Adult Literacy (WSAL) <http://www.aptv.org/PTVissues/workforce/index.cfm>
- Captured Wisdom - www.ncrtec.org/pd/cw/adultlit.htm
- Center for Applied Research in Education Technology (CARET) - <http://caret.iste.org>
- National Center on Adult Literacy – University of Pennsylvania – <http://www.literacy.org>
- California Distance Learning Project (CDLP) - www.cdlponline.org
- Community Technology Centers - www.ed.gov/programs/comtechcenters
- Digital Equity Toolkit - <http://www.editlib.org/p/10041>
- Distance Education Clearinghouse - www.uwex.edu/disted
- English For All (EFA) - www.myefa.org
- ESL/CivicsLink - <http://civicslink.ket.org>
- Expanding Access to Adult Literacy with Online Distance Education – http://www.ncsall.net/fileadmin/resources/research/op_askov.pdf
- Harnessing Technology to Serve Adult Literacy - <http://alri.org/harness.html>
- International Centre for Distance Learning (ICDL) - www-icdl.open.ac.uk
- International Society for Technology in Education (ISTE) - www.iste.org
- NIFL LINCS Technology Training Special Collection - www.altn.org/techtraining
- Outreach & Technical Assistance Network (OTAN) - www.otan.us
- Professional Development Kit (PDK) - <http://www.editlib.org/p/10887>
- PBS Literacy Link - <http://litlink.ket.org>
- Project IDEAL - <http://projectideal.org>
- The United States Distance Learning Association (USDLA) – www.usdla.org
- USA Learns - www.usalearns.org
- “The Verizon Literacy Network” - <http://literacynetwork.verizon.org>