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national technology laboratory for literacy and adult education

NATIONAL CENTER ON ADULT LITERACY

ADULT LITERACY PRACTITIONERS' READINESS TO USE TECHNOLOGY IN THE CLASSROOM: A FIVE STATE SURVEY IN 2002 - 2003

NCAL POLICY REPORT

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Introduction

According to the U.S. Department of Commerce, households within which the adults have lower levels of education are far less likely to own computers and have Internet access than those with more education (NTIA, 2002). As of 2001, among adults with less than a high school diploma, only 17% used computers and only 12.8% used the Internet. While these numbers represent progress since 1997 (up from 9% and about 2% respectively), they are quite a bit lower than those for high school graduates (about 48% and 40%) or those with some college (70% and 62% respectively). This effect of educational level on Internet usage is independent of family income. Thus those most in need of educational services are also those who are being left behind in terms of their access to resources, information, and technology familiarity and skills.

The adult education system is charged with improving the literacy, numeracy, and English language skills of undereducated adults. Surviving and thriving in the 21st century also requires the ability to use technology and manage much of daily life electronically in the workplace, within the community, and for the family. Data are entered electronically, employers want electronic resumes for job applications, bills are paid electronically, electronic voting is beginning in some states, and schools are starting to communicate with parents electronically. Thus, to meet the needs of adult learners, the adult education system should be providing them with access to technology and opportunities to acquire technology skills in ways that will facilitate their application in real life settings.

In adult education, as in most other sectors of society, the advent of technology has brought with it a multitude of new issues. First, issues of acquisition of hardware had to be addressed – decisions about which platforms to adopt, what equipment and peripherals to purchase, security needs, and funding. Then, technology proficiencies for teachers and adult learners had to be defined; high quality technology-rich instructional materials had to be developed; and appropriate professional development had to be envisioned, developed, and delivered for teachers to use instructional technology effectively in the adult classroom.

Technology can support different forms of education including distance education and classroom-based education (Ginsburg, 1998). Technology-moderated distance education has the potential to enable the participation of many adults who could benefit from adult basic education but do not currently register for face-to-face adult learning in programs. The premise is that technology allows people to bypass possible barriers of inconvenient times, places, or public embarrassment with anonymous, anytime, anywhere learning. The current status of technology-mediated distance education for adults within states has been examined in a number of reports (Askov et al., 2003; NIFL, 2000; Petty & Johnson, 2002).

Technology can also be used within adult education classes to enhance and enrich instruction and as a conduit for teachers' own professional education. To understand and support beneficial uses of technology within adult education, it is necessary to periodically monitor the availability of technology to teachers and learners. In addition, data on teachers' interest in and ability to use technology-based instructional resources effectively with learners can help policymakers and administrators make informed decisions about professional development priorities.

Over the last years, a number of assessment instruments were developed to help policymakers and administrators gauge teachers' and students' access to technology, teachers' comfort with technology, and the level of integration of technology into school instruction. The instruments were designed for the K-12 environment and focused on the level of institutionalization of technology [The CEO Forum on Education and Technology's *STaR Chart* (1998) and NCREL's *enGauge* (2000)] or teachers' levels of competency in using and teaching with technology [Professional Competency Continuum (Coughlin & Lemke, 1999), and SEIRTEC's Teacher Technology Survey (Sun et al.; 2000)]. While these instruments capture useful data for K-12 settings, many of the questions are irrelevant for adult education settings and do not capture the information that is of use to policymakers, researchers, professional developers, and others concerned with maximizing the potential of technology to enrich adult education instruction and learning.

The National Center on Adult Literacy (NCAL) completed technology surveys of adult education providers in 1994 and 1998. The initial national survey focused on technology planning and acquisition of equipment (Hopey, Harvey Morgan, & Rethemeyer, 1996) and the second survey focused on issues of funding, networking and telecommunication capabilities, and computer access by teachers and students (Sabatini & Ginsburg, 1998). In each of these surveys, the respondents were program directors reporting on the current state of technology within their programs.

At this point, most adult education programs may have computer hardware available for administrators and teachers. But are teachers using technology for professional purposes rather than only for record-keeping? Are learners able to access the computers to use as appropriate to facilitate learning? Are teachers familiar with a variety of resources available that are appropriate for adult learners? Are they able to use the resources with their learners? If not, are they interested in learning to do so? What professional development is needed and/or desired by the field so that teachers will be able to use instructional technology effectively?

Methodology

Online needs assessments were conducted in 2002 and 2003 in five states, Michigan, Ohio, Indiana, Pennsylvania, and Florida, through funding from the NorthCentral and SouthEast Regional Technology in Education Consortia (NCRTEC and SEIRTEC) and NCAL's TECH21 project. Thirteen states were offered the opportunity to conduct state surveys to learn more about the current use of technology within the state's adult literacy programs. Five state literacy directors or representatives of statewide professional development initiatives expressed interest in participating. Others cited interest but were hesitant to participate because of other survey initiatives in progress or being planned. The representative within each state sent out a request that teachers and administrators complete the survey as part of a needs assessment process to help inform decision-making about professional development in the area of technology. At least one representative at the state-level provided input on the development of questions for each state so as to adequately address any particular issues of importance of each state. A number of common questions were asked across all states to allow for aggregation of data across states.

The common questions addressed four issues:

- How much and what kind of access is available for teachers and learners?
- What are the levels of comfort with technology among teachers and of commitment to instructional technology within programs?
- How familiar are teachers/administrators with the use of various types of computer technology products?
- How interested are teachers/administrators in learning more about using various instructional technology products?

The sample

Potential respondents were offered the option of completing and submitting the survey in paper format rather than online, and a number of people chose to do that. Four hundred forty-four usable responses were received, with 46 from Florida, 107 from Indiana, 115 from Michigan, 111 from Ohio, and 65 from Pennsylvania. Thirty-nine percent of all respondents identified themselves as administrators, 28% as ABE or GED instructors, 4% as ESL instructors, 24% as administrators/teachers, and 5% as volunteers or aides. Six people did not identify their roles. Across states, the proportions of respondents' jobs differed; these will be noted when it seems important to the meaning of response patterns.

A sizable portion of the respondents identified themselves as administrators/teachers, not an uncommon role in many smaller adult education programs. Generally, these individuals and the teachers responded to all of the questions. Some individuals who categorized themselves as "administrators" did not respond to questions about classroom activities although many did, probably describing their observations of teachers and learners within their programs rather than their own current experiences.

Respondents evaluated themselves as to their "comfort with computers." Only one teacher and one administrator/teacher (less than 1% of the sample) said they were "uncomfortable" with computers and 15% of the respondents said they were only "somewhat comfortable." Approximately half said they were "comfortable" with computers and 34% said they were "extremely comfortable." These proportions may not be considered indicative of the universe of adult education professionals since participation was voluntary and those uninterested in the issue of technology may well have chosen not to participate, those without access may not have bothered to request a paper survey, and/or those with limited technology skills may have been intimidated. Research in the use of online surveys confirms that the medium impacts the sample of respondents (Mertler, 2003; Shannon, Johnson, Searcy & Lott, 2001). The assumption that these respondents are quite likely to be those who are relatively more comfortable with technology than their peers should inform the conclusions that can be drawn from the survey data.

In a recent paper-based survey, 39% of ABE teachers indicated they were "proficient" using PCs or Macintosh computers, another 40% considered themselves "moderately skilled," 12% felt they had "enough to get by," and 2.5% had "no skill" (Carter & Titzel, 2003). While the questions and response options differed, the teachers reporting to Carter and Titzel seem to indicate a somewhat lower level of comfort than did the respondents in the present study.

Findings

Access

When asked about who uses computers in their programs, approximately 90% of respondents reported that computers are used by administrators, teachers, and learners. Five percent said that their computers are used only by administrators or support staff and the remaining 5% said that only administrators and teachers have access to computers. Thus, for most of these respondents, access to computers does not seem to be the barrier it once was.

While almost all of the respondents (95%) reported that teachers use computers, they are not always able to use them for their own professional activities. Across the sample, 67% of those who said teachers have access to computers report that computers are often or always available for teachers to use for email or online searches for instructional resources. Administrators and administrator/teachers reported better availability than did teachers (73% vs. 59%), but whether this reflects differences in perception or accurate assessments of different settings cannot be determined. Eight percent of the respondents said computers are never available to teachers for their own professional purposes.

Whether or not teachers have access to computers for professional purposes may reflect the extent that programs have a “culture” that encourages educators to use technology in professional development. Eleven percent believe their program’s culture does not at all encourage this form of technology use, 36% say the choice is left to the individual teacher, and 53% say their program culture actively or at least to some extent encourages educators to use technology in professional development. Not surprisingly, there was a relationship between high encouragement and high access for professional use, though not as strong as would be expected.

Ninety percent of respondents report that learners use computers, but again, limited access may not be sufficient access. Respondents were asked if they thought that teachers and learners have sufficient access to productivity tools (word processors, spreadsheets, databases), online resources, and other media-based instructional materials (video tapes, audio tapes).

Approximately 20% of respondents, regardless of their position as a teacher or administrator, thought that teachers and learners only rarely or never have sufficient access to productivity tools and another 27% thought that “sometimes” access was sufficient.

Administrators (and administrator/teachers) and teachers described similar levels of Internet access for learners. Thirty percent said their learners always had access to Internet connections for learning activities, with another 16% saying their learners often had such access. Yet 18% said their learners never had access to the Internet and 14% only rarely had access.

Approach to technology

Among the strongest predictors of academic secondary school teachers’ frequent use of technology in instruction are teachers’ technical expertise and their use of computers for professional purposes, teachers’ informal and formal leadership roles, the number of classroom computers, and teachers’ philosophy as implemented in teaching practices (Becker, 2001). To see if there also seems to be a relationship between adult education teachers’ instructional

practices and their use of technology, a question was asked about how instruction is generally structured in the respondents' classes. The options, reflecting the most common instructional models found in adult education classes, included

- have learners working individually;
- work with the class as a whole, directing the group's activities;
- divide the class into groups of learners at the same or different levels;
- use a combination of whole and small groups, as well as individual work time; and
- have learners decide themselves how they want to work.

Most of the respondents either generally have their learners working individually (36%) or use a combination of group and individual activities (49%). Approximately 5% most often have teacher-directed, whole-class activities and 3% have multilevel groups as the predominant instructional model. Seven percent leave such decisions to their learners.

The particular instructional model favored by the respondents was not at all related to their comfort with computers. Of those who preferred individualized instruction, 18% were somewhat comfortable, 48% were quite comfortable, and 33% were very comfortable. Those who preferred the combination of group and individual activities presented virtually the same pattern of comfort with computers: 14% were somewhat comfortable, 51% were quite comfortable, and 35% were very comfortable.

Within the classroom, technology can be used for relatively mundane tasks such as typing, for basic skills drill, for problem solving, and for self-directed research activities. These activities are listed in increasing order of complexity and in their need for independent decision-making on the part of the learner. Thirty-three percent of the respondents said that learners use technology in their classes most often for basic skills drill and 39% reported learners using technology for problem solving activities. ("Problem solving" was not defined in the question, so it is difficult to know with certainty if the respondents understood problem solving to mean working on complex, meaningful problems as opposed to short, targeted "exercises" typically associated with skill drill.) On either ends of the scale, 14% reported that learners use technology most often for typing and 14% said for self-directed problem solving. (A total of 331 people responded to this question, not counting 36 people who said computers were not used at all by learners in their classrooms and administrators who did not respond to questions about classroom instruction.)

One might expect that the educator's level of comfort with computers might have some impact on the kinds of classroom activities s/he designs in which learners use technology. For example, few technology skills are needed for technology-mediated basic skills drill in that short responses or multiple choice formats are typically used. On the other hand, using technology for problem solving or self-directed research activities is more likely to involve using the Internet for research, using a spreadsheet to record data, using presentation software, writing and editing drafts of documents, and so forth. And indeed, there is some evidence of a relationship within the responses between increasing comfort with computers and classroom use of computers.

Because only 14% of respondents indicated typing or self-directed research as classroom technology activities, these two categories were combined with skill drill and problem solving, respectively. All told, 47% of the respondents indicated that their learners mostly use technology

for typing or skill drill. The other 53% said that their learners mostly use technology for problem solving or self-directed research activities. As can be seen from the table below, a greater proportion of those who said they are only somewhat comfortable with computers tend to have their learners use technology for typing or skill drill, compared with those who rank themselves as comfortable or extremely comfortable with computers.

Teachers' comfort with computers and the ways their learners use technology in classes

Teachers' level of comfort with computers	Generally use technology for these classroom activities	
	Typing and skill drill	Problem solving and learner-directed activities
Somewhat comfortable (n=47)	62%	38%
Comfortable (n=167)	45%	55%
Extremely comfortable (n=115)	44%	56%

In spite of the relatively small sample size and the self-selected sample of respondents, this finding is in line with findings of K-12 studies showing that teachers' technology skills and comfort impact on how they are likely to integrate technology into their classrooms.

Familiarity with technology resources

Over the last few years, some teachers have used various technology tools and products as classroom resources to enrich adults' learning experiences. These tools and products can be grouped into four categories: productivity software, the Internet, multimedia products, and integrated learning systems (ILSs).

Productivity software, such as word processing and spreadsheets, and the Internet serve multiple functions in everyday life but can be considered "learning resources" when their use within educational environments is planned and purposeful. While learning *about* these resources or even *how* to use them may well be useful to adults, the issue at hand is if and how these resources are put to use by teachers in classrooms to promote literacy, numeracy, and/or ESL learning.

Over the last few years, several multimedia instructional resources have been developed as educational resources specifically for adult learners, including *LiteracyLink's Workplace Essential Skills* (WES) and *GED Connection, TV411, Cyberstep, and English for All* (EFA). These systems generally include coordinated video, workbook, and online activities and can be used by teachers to enrich classroom activities, as the curricular basis for classroom activities, or by learners independently within or outside of classrooms. Some programs use Integrated Learning Systems (ILSs) such as *PLATO, NovaNet, or ELLIS* that were not originally developed for adults but have content that often maps well onto ABE/GED/ESL curricula.

Respondents reported whether or not they were familiar with each of the four types of technology products and, if they were, how capable they were in using the product with learners.

The increasing “capability” levels followed those in the *enGauge* model (NCREL, 2000) and were designated:

- I am familiar with this technology, but I am not sure how to use it with learners.
- I am familiar with this technology, and I have some strategies for using it with learners.
- I am very familiar with this technology, and I feel comfortable using it with learners.
- I am very familiar with this technology, and I could help others use it with learners.

Two important observations emerge from the responses as summarized in the table below. First, levels of familiarity with and use of productivity software and the Internet are similar; likewise, levels of the familiarity with and use of multimedia products are similar to those of Integrated Learning Systems. Second, less than half of the respondents are familiar with multimedia systems and/or ILSs while 92% are familiar with simple productivity software and the Internet.

Familiarity and experience using technology products with learners

	Not familiar with the technology product	Familiar with the technology product			
		I am not sure how to use with learners	I have some strategies for use with learners	I am comfortable using with learners	I could help other teachers use with learners
Productivity software	8%	26%	33%	17%	17%
The Internet	8%	22%	31%	21%	18%
Multimedia products	54%	23%	13%	7%	3%
Integrated Learning Systems (ILS)	58%	17%	13%	8%	4%

It is not surprising that almost all educators are familiar with productivity software and the Internet because these tools have become a part of everyday life. However, fewer than half of the respondents feel confident about using them with learners for educational purposes. In fact, ratings for these two variables showed a fairly high correlation ($r=.58$), indicating that people rated themselves similarly for familiarity and use with both tools.

Individuals’ levels of comfort with computers were also fairly highly correlated ($r=.54$) with using productivity software but much less so with using the Internet with learners ($r=.34$). This pattern seems right in that word processing or spreadsheets can be used in classes in ways that are similar to the ways they are used outside of the classroom. Using the Internet effectively with learners, however, may require the development of new and different types of instructional activities such as projects or other open-ended problem-solving tasks.

Interest in using technology with learners

The responding educators were not very familiar with multimedia products and ILSs, but were they interested in using such products and the Internet with learners? Here the pattern of responses across all four types of technology products is more consistent. Almost everyone is interested in learning more about using each of the technologies. Interest is highest in using the Internet within instruction – not surprising since this technology is more familiar to the respondents than either ILSs or multimedia products, and also less expensive. Administrators were somewhat more interested in using the Internet with learners than were teachers.

Interest in using technology products with learners
(n=376)

	Not at all interested	Might be interested	Somewhat interested	Interested	Very interested
Productivity software	3%	17%	23%	31%	27%
Internet	4%	10%	20%	31%	36%
Multimedia products	2%	21%	22%	27%	28%
Integrated learning systems (ILS)	5%	32%	20%	20%	23%

Priorities for technology professional development

While almost all respondents indicated that they were interested in learning more about each type of technology product, some needs or interests may be more salient than others. To establish the priorities for professional development planning and funding, respondents were asked to indicate the topic(s) that most appealed to them for their own learning. The choices were the following:

- Using the Internet to find instructional resources.
- Using multimedia instructional resources (*LiteracyLink, TV411, Cyberstep, English for All*) with learners.
- Using productivity software (word processing, spreadsheets, databases) with learners.
- Developing class projects that use the Internet and productivity software.
- None of these.
- All of these (available as an option on surveys in three states).

These particular response options were chosen to provide additional information on the technology topics addressed in the rest of the survey and on the TECH21 project goals, although many other topics of interest could also have been included, such as “Facilitating distance education” or “Using videoconferencing for professional development.”

Ninety-three people responded “All of these,” which indicates a high interest by many in any offering of technology professional development. Eleven people selected “None of these.” The remaining responses are summarized as follows:

What topic most appeals to you for your own learning?

Topic	%
Using the Internet to find resources	21%
Using multi-media instructional resources	21%
Using productivity software with learners	16%
Developing class projects that use the Internet and productivity software	42%

The sizable interest in developing class projects that use the Internet and productivity software probably builds on the educators’ existing familiarity with these resources and also their easy accessibility. But in addition, the educators recognize that the context in which technology is used must lead the use of the technology. At the same time, the interest in developing class projects was surprising in light of the number of respondents who indicated that they generally have learners working independently and/or currently use technology for skill drill.

Conclusions

There are a number of concerns about the generalizability of online surveys, in as much as those who responded may not reflect the target population. In addition, for this study, only certain states were sampled and the request to participate came from a representative of a state agency; thus the request may have gone out to different categories of people within the different states. In addition, different states deliver adult education through very different entities, including school districts, community colleges, and community based organizations. The constraints of program structure and/or its culture, funding, decision-making authority, and learning context (workplace, classroom-based, individualized) may limit the experiences of the respondents as well as their opportunity to experiment with alternative instructional methods and materials. Finally, only a subgroup of those who were invited to participate within each state chose to participate, so the sample is composed of people who self-selected to participate. The group may be skewed toward those who were particularly interested in technology issues, those who were better able to access and feel comfortable using an online survey, or those who were more forthcoming in making their opinions known. That said, there are some general observations that can be made about the group of respondents.

Eighteen percent of respondents said their learners *never* have access to the Internet. Since adults with low levels of education are among those least likely to have access to the Internet in their homes, *adult education programs can and should fill a community need by providing opportunities for adults to become familiar with the Internet and use the resources of the Internet to support their ABE/GED/ESL studies.*

The adult educators who responded to the survey seem to be fairly comfortable with computers and very interested in increasing computer use within their programs. Their programs provide some access to computers for administrators, teachers and learners, but only half thought their programs had sufficiently good access to productivity tools, online resources and other media-

based instructional materials. Adults' familiarity with and ability to use productivity tools positions them for entry or advancement in the 21st century workplace. *Adult education programs can provide learners with technology-rich instruction so that they also acquire skills in the appropriate use of productivity tools.*

As has been found with K-12 teachers, adult educators' own technology skills and comfort with computers is related to how they use technology in their classes. Thus, to best assure that technology is used to support higher level problem solving and conceptual learning, educators need time to develop their own competency with technology. For some, this may be best accomplished within group professional development while for others, a mentor or online tutorial may be effective. Further, it is always helpful for teachers to see how other educators are integrating technology into instruction. *Captured Wisdom*, NCAL's video stories of effective technology integration by diverse adult educators, is a useful and readily available resource that can be used. In all cases, *if the integration of technology is deemed to be desirable, time needs to be set aside to support teachers in this effort.*

While the respondents are familiar with productivity software and the Internet, they are interested in increasing their repertoire of strategies that employ these technologies effectively for adult learning. They recognize that these tools are most effectively used in a project-based learning environment. *Professional development relating to technology has to, first and foremost, focus on how to design effective instruction with higher order thinking and problem solving rather than promote the use of technology for repetitive drill on low-level skills.*

From this sample, relatively few adult educators are familiar with the use of the multimedia products that were developed specifically to meet the needs of adult learners. These resources require an outlay of funds for use, but many states have arranged for state licenses for the multimedia products allowing all programs to gain access to the product. TECH21 has developed and posted professional development materials that can be used to inform teachers and administrators of many of these resources. *Raising the field's awareness of high quality resources continues to be a challenge; effective professional development in both face-to-face and virtual modes can address this challenge.*

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