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ABSTRACT

This set of four newsletters contains articles to help adult basic education and literacy teachers connect research and practice. The following are among the articles included: "The Effects of Continuing Goal-Setting on Persistence in a Math Classroom" (Pamela Meader); "Do the Cognitive Skills of Dropouts Matter in the Labor Market?" (John H. Tyler); "The Relationship between Reading and Speaking Skills" (Barbara Garner); "Supports and Hindrances: A Force-Field Analysis" (Andrea Parrella); "Developing Adults' Numerate Thinking: Getting Out from Under the Workbooks" (Mary Jane Schmitt); "Making Peace in the Math Wars" (Kathy Safford); "The New York City Math Exchange Group" (Charles Brover, Denise Deagan, Solange Farina); "Numeracy Needs of Adult Literacy Participants" (Aydin Yucesan Durgunoglu, Banu Oney); "Using Software Applications to Teach Math" (Catherine Cantrell); "Accommodating Math Students with Learning Disabilities" (Rochelle Kenyon; "Beginning Math for Beginning Readers" (Linda Huntington); "Across the Great Divide" (Jeri Levesque); "Learning with Computers: The Theory behind the Practice" (Jennifer G. Cromley); "Teaching

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ESOL [English for Speakers of Other Languages] Using Word Processing: A Communicative Approach" (Steve Quann, Diana Satin); "Low-Tech: Calculators, Videos, and the Abacus" (G. Andrew Page); "Building a Web Site in an ABE [Adult Basic Education] Class" (Maura Donnelly); "Solving Problems with Computer-Assisted Instruction at the East Texas Literacy Council" (Kelley Snowden); "The Working Conditions of Adult Literacy Teachers: Preliminary Findings from the NCSALL [National Center for the Study of Adult Learning and Literacy] Staff Development Study" (Cristine Smith, Judy Hofer, Marilyn Gillespie); "Connecting Research and Practice" (Barbara Garner, Beth Bingman, John Comings, Karen Rowe, Christine Smith); "The K-12 School Experiences of High School Dropouts" (Stephen Reder, Clare Strawn); "Program Participation and Self-Directed Learning to Improve Basic Skills" (Stephen Reder, Clare Strawn); "Sharing What NCSALL Is Learning" (John Comings); "Adult Basic Education and Professional Development: Strangers for Too Long" (Bruce Wilson, Dickson Corbett); and "Current Research in Adult Learning and Literacy" (Jessica Mortensen). (MN)

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Focus on Basics

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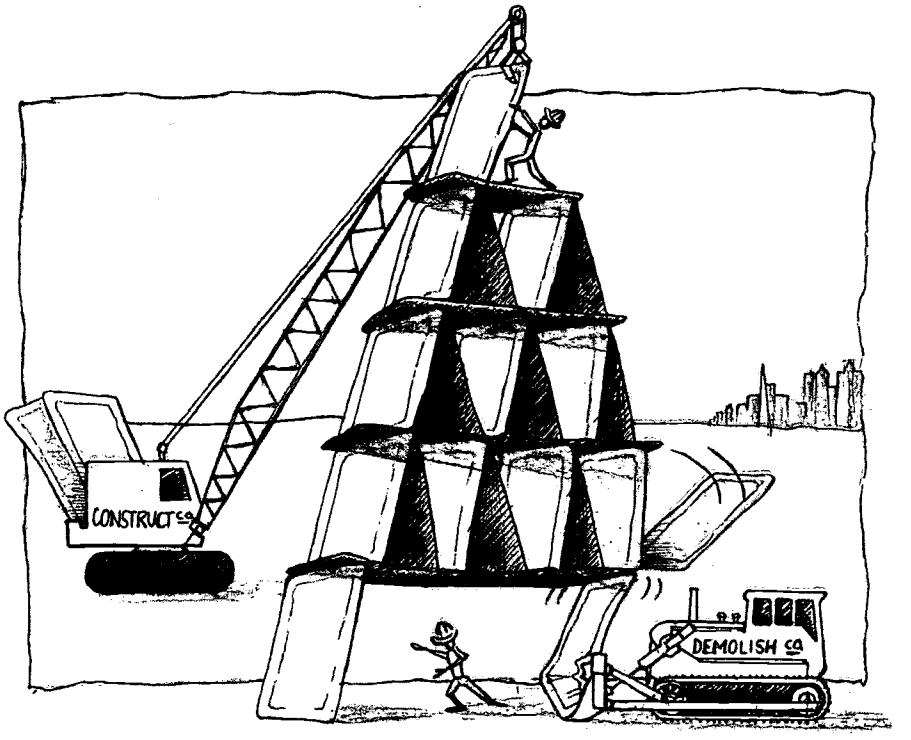

Helping Adults Persist: Four Supports

NCSALL's Adult Persistence Study suggests that managing positive and negative forces, self-efficacy, setting goals, and making measurable progress help learners stay in programs

by John Comings, Andrea Parrella, & Lisa Soricone

Adults choose to participate in educational programs while children participate because of legal mandates and strong social and cultural forces that identify schooling as the proper "work" of childhood. In fact, most school-aged students probably never seriously consider dropping out. An adult, on the other hand, must make an active decision to participate in each class session and often must overcome significant barriers to attend classes. Most adults come to adult basic education (ABE), English for speakers of other languages (ESOL), or adult secondary education (ASE) programs with goals that require hundreds if not thousands of hours of learning to

Continued on page 3

Focus on Basics is the quarterly publication of the National Center for the Study of Adult Learning and Literacy. It presents best practices, current research on adult learning and literacy, and how research is used by adult basic education teachers, counselors, program administrators, and policymakers. *Focus on Basics* is dedicated to connecting research with practice, to connecting teachers with research and researchers with the reality of the classroom, and by doing so, making adult basic education research more relevant to the field.

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NCSALL
National Center for the Study of Adult Learning and Literacy

WORLD EDUCATION

Welcome to *Focus on Basics*

Dear Readers,

It's a thrill when findings from different research studies build on each other. As we assembled this issue of *Focus on Basics*, we realized that the two NCSALL studies reported in this issue are intrinsically linked.

John Comings, Lisa Soricone, and Andrea Parrella have been interviewing adult learners to understand what makes some people persist in their studies while others drop out. Their preliminary findings, which are presented in our cover article, suggest that there are four types of support programs can give to learners to help them persist.

John Tyler's research on the economic impact of cognitive skills suggests that the answers to questions about persistence are even more important than we knew. Tyler's findings, which he presents on page 15, indicate that skills do matter, not just for college graduates but for holders of the certificate of General Educational Development (GED) as well. Higher skills translate into higher earnings over time. This means that just passing the GED isn't good enough: learners must improve their scores by improving their skills. They must persist.

As part of its efforts to test the practical implications of research findings, NCSALL encourages teachers to implement changes based on NCSALL research findings and conduct practitioner research to better understand the impact of those changes. Despite considerable effort, Pam Meader, a math teacher from Maine, was plagued by high drop out rates. Intrigued by Comings' finding that setting — and reaching — goals helps learners persist, she introduced goal setting to her math class. Turn to page 7 to read about what she discovered.

Marti Giese, of Virginia, was also trying to get learners in her program to persist in their studies. She and a colleague developed an orientation program that helped potential learners work together to research their educational options, and data indicate that the learners made more appropriate choices for themselves as a result. She writes about her experiences in the article that begins on page 11.

English for speakers of other languages (ESOL) teacher Ann Hilferty has been examining the relationship between speaking and reading in teaching English to speakers of other languages (ESOL) learners. Her reading of the research indicates that there is reciprocity between the two. I interviewed her to learn more. This interview can be found on page 17.

Interested in helping learners understand the forces that help them in and hinder them from persisting in their studies? Turn to "Focus on Teaching" on page 19, where Andrea Parrella provides us with the steps needed to do a force-field analysis suitable for the beginning of a school term. If you try this in your program, please let us know how it goes, either via the *Focus on Basics* electronic discussion list (see page 14 for information on how to subscribe) or by e-mail, at FOB@worlded.org. We look forward to hearing from you!

Sincerely,

Barbara Garner

Barbara Garner
Editor

Supports... *continued from page 1*

achieve. Every adult education program should help adult students persist in their learning until they reach their educational goals.

The National Center for the Study of Adult Learning and Literacy (NCSALL) is conducting a study on learner persistence. The first phase of NCSALL's study used research as a tool to develop advice for practitioners on how to help adults persist in their studies. In addition, the study developed advice for policymakers on how to structure funding and accountability systems in ways that will support persistence. The next phase of the study will test and refine this advice in programs. In the first phase of this research, the study team read previous studies and related literature, and talked with practitioners about how they have tried to help adult students persist longer in their studies. The team also interviewed 150 pre-general educational development (GED) students in New England to gain their insights into the supports and barriers to persistence. Most of the students were native speakers of English, but a few were immigrants whose English was sufficient for them to be in a pre-GED class.

Defining Persistence

The staff of the Persistence Study spent time working on their definition of persistence so as to be clear about what they were trying to measure. They found persistence to be a complicated concept. Most of the literature on adult education defines persistence as the length of time an adult attends a class or tutoring sessions (Beder, 1991; Comings, 1995; Quigley, 1997; Tracy-Mumford, 1994; Wikelund, Reder, & Hart-Landsberg, 1992; Young, Fleischman, Fitzgerald, & Morgan, 1994), but learning may extend beyond attendance in a specific program. The definition of persistence used in this study is: *adults staying in programs for as long as they can, engaging in self-directed study when they must drop out of their programs, and returning to a program as soon as the demands of their lives allow.* The study team interviewed learners near the beginning of their participation in a program and again four months later. A persistent learner was one who, at the second interview, was still in class, was no longer in class but was involved in organized self-study, or who had transferred to another class.

"Adults who mentioned a specific goal, such as 'help my children' or 'get a better job' when asked why they had entered a program, were more likely to persist than those who either mentioned no goal or said they were doing it for themselves."

Advice

We classify adult students in many ways: by gender, ethnicity, age, employment status, number and age of children, previous school experience, and educational background of other adults in their lives. The first phase of the Persistence Study revealed that these categories do not tell us much about how to help adults persist in their education. The only significant findings were that immigrants, those over the age of 30, and parents of teenage or grown children were more likely to persist than others in the study. The greater likelihood of persistence by immigrant students in ESOL classes is well documented (Young, Fleischman, Fitzgerald, & Morgan, 1994). The findings of this study suggest that this effect continues as immigrants learn English and move on to ABE and GED programs. Grown children might encourage their parents to join and persist in a program. On the other hand, adults who are over 30 are more likely to have teenage or grown children than those under 30. These findings might point to older students persisting longer because they benefit from the maturity that comes with age and they no longer have the responsibilities of caring for small children.

Two aspects of educational experience were also associated with persistence. Adults who had been involved in previous efforts at basic skills education, self-study, or vocational skill training were more likely to persist than those who had not. The strongest relationship was with those who had undertaken self-study. Adults who mentioned a specific goal, such as "help my children" or "get a better job" when asked why they had entered a program, were more likely to persist than those who either mentioned no goal or said they were doing it for themselves. These findings suggest that experience with education may increase an adult's self-confidence about learning. These relationships also suggest that motivation, especially as demonstrated by undertaking self-study or by being clear about the goal for attendance, supports persistence.

The pre-GED students identified

Persistence and Accountability

From the point of view of an accountability system, student persistence ends when an adult drops out of a program. When an adult returns to a program after a lapse in attendance, the program may view that student as a dropout who has returned. From the point of view of the student, persistence may continue after drop out through self-study or distance learning. The adult may view him- or herself as a persistent learner who could not attend for a while. Using only attendance in class or in tutoring sessions as a measure of persistence undervalues effective learning activities that should be encouraged. A wider definition of persistence would allow practitioners to focus on helping to become persistent learners adults who use episodes of program participation as critical parts of a comprehensive learning strategy that involves other forms of learning.

The definition developed by the study team in the Persistence Study values self-study, transfer, and reentry into a program as part of a pattern of persistence. For this expanded definition of persistence to become part of an accountability system, it must be measurable. This would require procedures for collecting evidence of "time-on-task" that could be credited to a program. Some of this "time-on-task" might be spent in classes, some in tutoring sessions, and some in self-study through technology, media, or instructional materials. Other "time-on-task" measures might include increased time reading or reading of new, more challenging materials and engagement in community improvement efforts that require the use of English, literacy, and math skills. Methods of measuring and validating these efforts and linking them to a plan of learning developed within a program context would transform some dropouts into persistent learners who are not presently attending formal classes or tutoring sessions.

This expanded definition would require programs to relate to their students differently. Programs would need added resources to stay connected and serve adults who are not attending formal classes or tutoring sessions. With these added resources, programs could treat their students as long-term clients who use a wide range of services, some provided by the program and some by other agencies, to achieve significant improvement in their skills. Since a single adult student might participate in the services of several different programs, a way to document progress would have to be shared among them. ❖

a range of supports and barriers to their persistence; clear trends were evident when the study team analyzed their responses. The team recorded these trends, reviewed the research literature and the data from interviews with practitioners, and developed the following advice, which describes four supports to persistence.

The first support is awareness and management of the positive and negative forces that help and hinder persistence.

In searching for a framework for analyzing data, the study team sought a theoretical model that would both place the adult learner in a central position and be useful to program managers seeking practical advice on how to increase persistence. The study team chose to employ a force-field analysis as developed by the sociologist Kurt Lewin. Lewin's theory places an individual in a field of forces that support or inhibit action along a particular path (Gilbert, Fisk, & Lindzey, 1998; Lewin, 1999). Understanding the forces, identifying which are strongest, and deciding which are most amenable to manipulation provide an indication of how to help someone move in a desired direction, such as reaching an educational goal.

In the case of adult students, positive forces, such as the desire for a higher income, help support persistence in an adult education program. Negative forces, such as lack of free time to study, push adults to drop out. From the time adults enter programs to the time when they either achieve their goals or drop out, both positive and negative forces are acting upon them. Any intervention by an ABE program meant to increase persistence must help adults to strengthen the positive forces and lessen the negative forces.

The force-field analysis looks at barriers and supports as existing at many levels of importance, from those that have no real effect on persistence to those that have a very strong influence on persistence. The force-field analysis also suggests that strengthening or weakening a force that can be influenced might offset the effects of another force that cannot be influenced. Thus, an adult with a very strong need for education to gain better employment might put aside his or her embarrassment, while very strong embarrassment might keep a less strongly motivated student from coming to class.

Programs must help students to develop an understanding of the negative and positive forces that affect their persistence. Building on that understanding, each student must make plans to manage these forces so that persistence is more likely. The plans that come out of such an exercise should include strategies for persistence when the forces that affect a person's life cause them to drop out, and these plans must be revised as adults persist in their studies and these forces change.

Adult students in this study emphasized positive forces. The strongest positive force mentioned by adult students was the support of people, particularly their families, friends, teacher, and fellow students, followed by self-efficacy and personal goals. Most learners mentioned at least three positive forces, while some

mentioned many more. At the same time, many learners mentioned no negative forces or just one. Of the negative forces mentioned, no single force was common.

The force-field theory itself offers a tool for understanding and planning to manage these forces. Students can be encouraged to discuss their persistence in terms of the force-field and to build their plan from that discussion. A classroom force-field activity can begin with students identifying all of the supports and barriers to their persistence. [See page 19 for directions on how to lead this activity in your classroom.] They can then categorize them into those that are most likely to help or hinder their persistence.

Once the crucial forces are identified, students can plan to build their supports and reduce their barriers. As happens in some programs, staff must be open to having the outcome of this activity be early dropout for students who, for any reason, are not ready to persist in their studies. If this is the outcome, adults should be helped to make a plan to prepare to return and be successful later. The management of these forces may be an individual responsibility, one that a group of students takes on together, or one that engages a whole community. For example, students might have transportation needs. A group activity might lead to ride sharing or a request to a public agency for transportation support.

The second support is self-efficacy.

The educational program must help adult students build self-efficacy about reaching their goals. The term *self-confidence* is used more often in adult education literature, but self-efficacy is a more useful term to describe this support. Self-confidence is a global feeling of being able to accomplish most tasks. Self-efficacy is focused on a specific task and represents the feeling of being able to accomplish that task, which in this context is successful learning in ABE, ESOL, or ASE programs. The study drew from the theory of a social scientist, Albert Bandura, for advice on building self-efficacy (Bandura, 1986). Adult education programs should provide the following experiences to their participants as a means to build self-efficacy.

"Adult learners should come in contact with adults who are just like them and have succeeded in an ABE, ESOL, or GED class."

Mastery experiences allow an adult to be successful in learning and to have authentic evidence of that success. This does not mean that instruction should be designed to produce only easy and constant success. Adults must also experience overcoming failure and eventually achieving success through a sustained effort. Instruction should help them develop this insight. Some programs take care to provide regular recognition of progress and celebrations of achievement. Others make sure that instruction provides opportunities for success early in program participation. These efforts provide learners with opportunities to experience success.

Vicarious experiences are those provided by social models. Adult learners should come in contact with adults who are just like them and have succeeded in an ABE, ESOL, or GED class. These role models, both through the knowledge they share directly and the indirect teaching of their behavior, help adult students to acquire the skills to manage the many demands of learning. Some programs employ successful present or former students as speakers during intake and orientation activities, while others recruit past learners as counselors, teachers, and directors. These past students provide models of success.

Social persuasion is support from teachers, staff, counselors, fellow students, family, and friends that reinforces self-efficacy. These verbal assurances are needed, in part, to overcome the negative self-efficacy about learning built up during previous schooling. Most practitioners provide verbal assurances, but some programs encourage family members to provide this positive reinforcement as well. Some teachers take great care to develop a culture of support among students in their classes. These efforts ensure positive support for students.

Addressing physiological and emotional states is the acknowledgement that negative feelings can result from poor self-efficacy and can also lead to low self-efficacy. Examples of these states are tension and stress, among other negative emotional states. Adult learners must be helped to perceive and interpret these conditions so that they do not affect their self-efficacy. Some practitioners feel uncomfortable addressing the personal problems of their students, and all practitioners must

acknowledge that they are not trained mental health professionals. Even so, many teachers use life histories and dialogue journals to help students identify the physical and mental states that can affect their learning. For example, adults with limited English skills may feel anxiety when they have to speak in class. A teacher might ask her class to write about these feelings and practice speaking even with anxiety. Just the acknowledgement that feelings can affect learning can help diminish their negative effect.

Many of the orientation and instructional activities identified by practitioners in this study provide the experiences that Bandura has outlined. Bandura's theory of self-efficacy can act as a powerful framework within which programs can improve on the activities they have already undertaken.

The third support to persistence is the establishment of a goal by the student.

This process begins before an adult enters a program. An adult who could be classified as a potential ABE, ESOL, or ASE student experiences an event in his or her life that causes him or her to enter an educational program. The event might be something dramatic: a person might enter the United States as a refugee and find that she does not have the language skills needed to qualify for a job. The event might be less dramatic: a parent may decide he needs more education when his first child begins school. The event might be subtle: a school dropout might have always felt the desire to study for the GED and when her children are older and need less attention, she finally has some free time available for education. This event provides potential adult students with goals they hope to accomplish by entering an ABE, ESOL, or ASE program. The staff of the educational program must help the potential adult student define his or her goals and understand the many instructional objectives that must be met on the road to meeting that goal. Teachers must then use these student goals as the context for instruction and intermittently review them, since they may change.

The fourth support is progress toward reaching a goal.

Since goals are important supports to persistence, adult students must make progress toward reaching their goals. They must also be able to measure that progress. Programs must provide services of sufficient quality that students make progress, and programs must have assessment procedures that allow students to measure their own progress. Much of the recent interest in measuring progress has come from the need to build systems of program accountability. Helping students measure their own progress may require tools and methods that are not appropriate for accountability purposes. Accountability systems need measures that are easy to collect and quantify. These may not be useful to students and difficult to integrate into instruction. Portfolio and authentic assessment approaches may have weaknesses in an accountability system but might be very useful for adults who want to measure their own progress. These kinds of assessments can be an integral part of an instructional approach.

Further research into assessment might produce a hybrid system that serves both needs and could lead to certification of progress that occurs more frequently than at present in most programs. At this time, most adults who enter ABE, ESOL, or ASE programs will gain certification only if they pass the GED test or acquire an adult high school diploma. Program-level certification may be helpful to student morale, but state-level or even national certification of achievement might make smaller increments of learner achievement more meaningful and provide a range of goal steps.

In Conclusion

Aspects of these four supports already exist in some programs, but a combination of the four may provide a more supportive environment to persistence. These supports are more likely to be built if the policymakers who provide funding value them. This means that persistence must become a more important measure in program accountability. Funding agencies must provide the technical assistance and training needed for programs to put these supports in place. Policymakers could then hold programs accountable for the quality of their intake, orientation, instruction, and program approaches that support persistence. Using the expanded definition presented here, persistence itself should be an outcome measured as part of an accountability system.

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Full Report Available

For information on how to order the full report from which this article is drawn, turn to the Blackboard on page 20.

Focus On Basics

Next Issue:
Mathematics
Instruction

The Effects of Continuing Goal-Setting on Persistence in a Math Classroom

by Pamela Meader

I have been a math teacher for Portland Adult Education (PAE) in Portland, ME, for more than 15 years. For the last three years, I have been Maine's practitioner research and dissemination leader for the National Center for the Study of Adult Learning and Literacy (NCSALL). One of my responsibilities as leader was to conduct a practitioner research project that relates to one of the ten research projects being sponsored by NCSALL. I was interested in John Comings' research on learner motivation and retention (see page 1). In this research, Comings and his research team surveyed students who were successful in completing their objectives. They found that these students felt that setting goals helped them in their persistence. I decided to observe what effect continuing goal-setting in a math class would have on learner persistence.

We at PAE have worked hard to make our program accessible, and particularly to make our math courses interesting and inviting as they have evolved over time. Ten years ago, we offered math in a lab setting: students worked individually. We provided no group work or teacher-led lectures. As our program grew and we began to learn of the National Council of Teachers of Mathematics' standards, we decided to offer math classes that covered a range of math disciplines. [For more on NCTM, see *Focus on Basics*, Volume 3, Issue B, page 19.] We incorporated teaching strategies such as cooperative learning, the use of manipulatives, and journal writing and reflection. We also gave math inventories before we placed students into math courses to ensure that students would feel prepared. The inventory we used was the Math Pre-GED form CC test, with teacher-made inventories for more basic math students.

All of our courses, including math, were free for General Educational Development (GED) and high school diploma candidates; all others paid a fee of $40 to $50 per course plus book purchase or were provided with a fee waiver of $50 if they met income guidelines. We provided transportation for those who lived on the school bus route, and the city bus had a stop at our school. Our program had childcare for eligible students in daytime classes. The only mandatory attendance was for the high school diploma students: to receive high school credit for a course, they could not miss more than three classes. Attendance was not mandated for the other students, but was necessary if they wanted to receive a grade. Despite the services PAE provided and the efforts we made to make the class atmosphere less intimidating, our dropout rates were more than 50 percent in our math classes.

I teach four math classes, each of which meets twice a week for two-and-a-half hours each session. In this

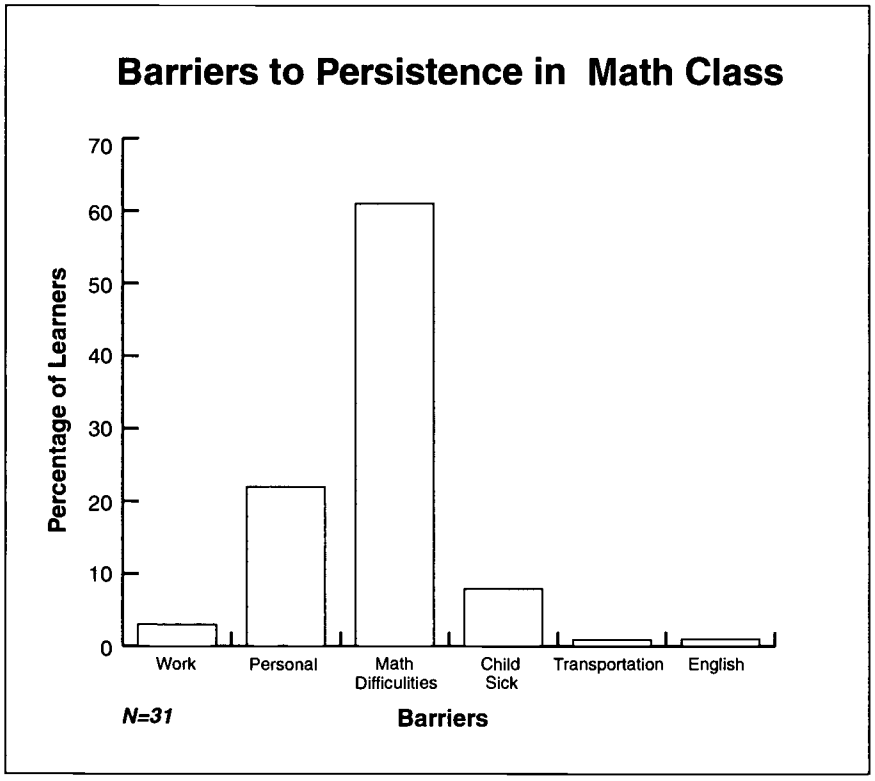
article, I will share the findings from my two Math Concepts classes. Math Concepts is a course designed to help GED students pass the GED math test; it also serves as a pre-algebra course for learners who need a stronger foundation before entering into an algebra class. We had found earlier that combining pre-algebra and GED-bound students in the same class has had a positive effect on persistence. The GED students witness the college aspirations of the pre-algebra students while the pre-algebra students support the GED students as they prepare to take the test. Most of our pre-algebra learners have their high school diplomas, but sometimes some are taking the class for high school credit. My morning Math Concepts class consisted of 21 students and my evening Math Concepts class consisted of ten students. Of the 31 students total, 13 were pursuing their GEDs, eight of whom were English for speakers of other languages (ESOL) students; four were taking the class for high school credit; and the remaining 14 were college preparatory students.

Gathering Data

During the first class, I explained that NCSALL's learner motivation research found that students who persisted in an adult basic education course attributed this persistence, in some measure, to goal-setting. I had the learners fill out a goal-setting questionnaire based on a survey *Conquering Math Anxiety* (Arem, 1993). It included questions about the barriers and positive forces that might exist for them as they pursued their stated goals. They then listed the action steps they considered important to pursuing their math goals. I gave students a week to work on this and then collected the questionnaires. I responded individually to each person's work.

In the past I had observed that the initial loss of students occurred within the first four to six classes, so I decided to have the learners revisit their goals during the fourth class, reviewing what they listed as barriers and positive forces. As a group, we discussed whether any positive forces had been working for them and if any new barriers had occurred that they had not listed. I also asked them to consider which action steps they were doing consistently and which they thought they needed to work on. In about four weeks (eight classes later) I asked them to revisit their goals once more. I also asked if they thought, with only 11 classes remaining, that they would persevere to the very end. Many responses were more like affirmations: "I feel I will. I didn't say at times it may be a struggle, but I am sure that I can manage through, it's only 11 more!!!" "Most definitely, if I was going to quit, it would have been earlier in the class."

At the end of the course, I asked the students who remained to fill out one more questionnaire rating the factors that kept them attending, the factors that kept them connected, and the factors that made it difficult to continue in the course. I also asked them to rate the effect goal-setting had on them completing the course.



The Findings

When I started this project, I assumed that my GED students would have difficulty articulating their goals. I could not have been more wrong. The Math Concepts (GED) learners gave heartfelt testimony to what they perceived as their goals, barriers, and positive forces. "My mom sent me up here to finish my schooling and to better myself in many different things so I am going to achieve my goals and make my mom and the rest of my family proud of me and to be proud of myself," one learner said. My second surprise was the list of barriers and positive forces. NCSALL's learner motivation project was not specifically focused on math. Those researchers found work, childcare issues, and transportation to be some of the barriers to persistence. The primary barrier that inhibited learners

completing my math class, however, was dealing with various math difficulties and phobias.

The "fear of failure" appeared in many responses; frustration with mathematics and embarrassment at not knowing a particular concept also were evident. As seen in the bar graph on page 8, math difficulties were the barrier that students perceived as keeping them from finishing a class. Study strategies was the positive force most emphasized. Strategies such as asking questions of the teacher and classmates, listening, studying, attendance, and completing homework were some of the more numerous responses listed by the participants at both levels. Psychological and academic barriers were at work here, not situational barriers such as transportation.

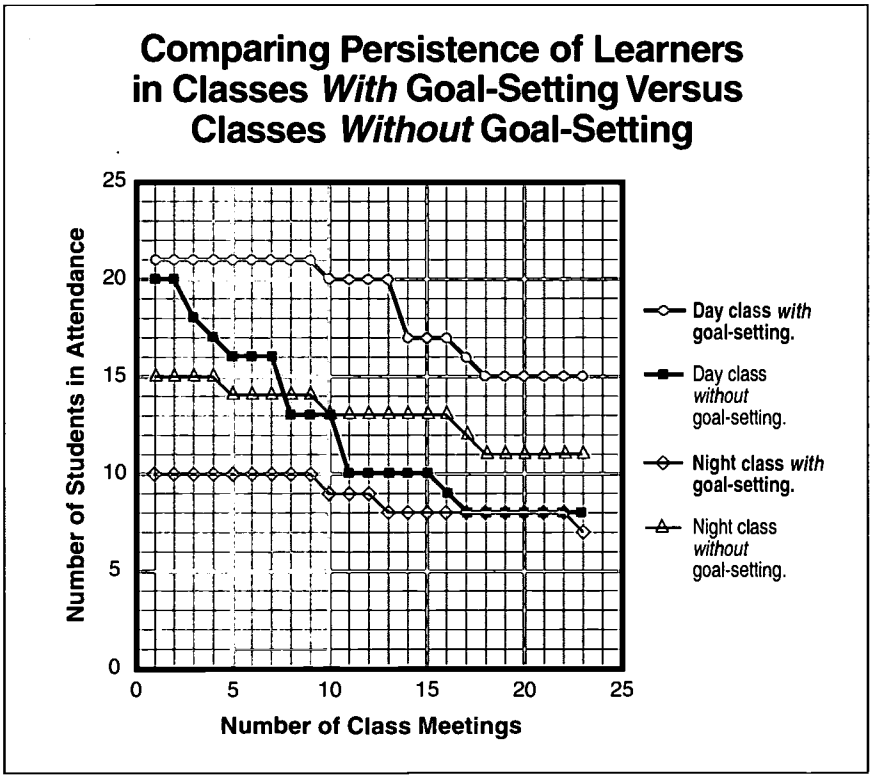
The exit survey yielded additional interesting data. I asked the learners to indicate if they were male or female so I could compare the responses by gender. In answering the question, *What factors kept you coming to class?*, the top four responses to that question for men, in order of importance, were 1) the need to understand the math, 2) goals, 3) the teacher, and 4) friends. Women had as their top choices: 1) the need to understand the math, 2) the teacher, 3) goals, and 4) to get a GED. I also asked the exiting students to assess what factors made them feel connected to the class. Again the responses were different for men and women. I was surprised that the men rated reviewing goals as the most important factor in helping them feel connected while the women had the teacher as first. This might be because I am a woman math teacher and women tend to focus on connectedness. I also recognize that I was biased. I thought that men were probably not comfortable talking about goals or might feel that the goal-setting exercise was not necessary. I learned that goal-setting was very important to this group of men.

I asked the learners to rate the factors that made it difficult for them to attend class, even though this group did complete the course. Again the responses were different for the men and women in my classes. The men placed work as their barrier and the women placed being ill as their number one barrier. Each of these pieces of data provided me with information about persistence and attendance, but my initial question was directed at seeing if retention was affected by placing emphasis on goals. The graph below displays persistence in four Math Concepts classes, two held during the day and two held in the evening. In the classes of similar makeup and size where we engaged in goal-setting more students stayed longer before dropping out.

In the day class that utilized goal-setting, the retention rate was 71 percent compared to 45 percent for the group that did not set goals. In the evening class the rates were relatively the same: 70 percent for the goal setters compared to 73 percent without goal-setting. And notice that learners in the goal-setting group dropped out later in the course: there was 100 percent retention in the goal-setting class for nine classes compared to 93 percent in the non-goal-setting group. By the 18th class, the retention rate for the goal-setting group was 80 percent while the non-goal-setting group had dropped to 73 percent. In fact, the retention rate for the goal-setting group remained at 80 percent until the last class. This merits attention because the longer we can keep GED students attending class, the better their chances are of success on the GED math test.

Conclusions and Implications

My primary reason for conducting this research was to see how effective goal-setting was to student retention in a math class. I learned about much more than that. I found that for some of my Math Concepts students, goal-setting was an important part of their



commitment to succeed while others were less enthusiastic. One GED student stated, "I think these goal sheets are really good and they help you." Another said, "Almost every night I reaffirm it [goal] in my journal that I will get to class and complete my assignments." However, another learner commented, "They haven't really had any effect on my commitment to this class."

For goal-setting to be effective, it must be continuing. For me, this meant incorporating this practice into my lesson plans so that my students and I were consciously aware of the process. In addition, I learned that retention is affected by many factors, not just goal-setting. I discovered the importance of dealing with math anxiety. Before my research project, our math staff had made a conscious effort to address fear of math through journal writing, lab activities, group work, and tutoring. We also tried to establish a community of concerned students who looked out for each other. It is clear we should continue to do even more. In fact, this past semester we asked all our math students to think about the barriers that would keep them from completing a math course. At all levels, from basic math through algebra, math anxiety was the compelling negative force.

We are now collecting data from our students who have persisted through a course to see if their attitudes about math have changed and what contributed to this change. Of 40 students polled in December, 12.5 percent said they hated math and 32.5 percent were afraid of math when they began the math course in September. When leaving the math course, this improved to 0 percent hating math and only 2.5 percent fearing math. Also, at the beginning of the courses 0 percent loved math; exiting, 25 percent indicated a "love of math." Our next project will be to try to locate students who did not persist to see if their math attitudes changed.

This was the first time that I participated in a practitioner research project. Although I was hesitant at first, practitioner research has transformed me. I found it a valuable tool to "quantify" a "gut feeling" that I had. It also raised more questions. I am now using the practitioner research model with students by requiring my algebra students to research a question they have and use their graphing skills to analyze their data.

My research has convinced me that emphasis on goal-setting is worthwhile. I also realize that goal-setting must be a continuing process, not just an introductory activity at the beginning of a course. And, as one research question is answered, others surface. What effect would an orientation for all students have at which goal-setting issues are discussed? Would weekly discussions of goals be more effective than monthly? How can we better address the problem of math anxiety? This research raised many questions and concerns and certainly merits our attention.

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About the Author

Pam Meader, a former high school math teacher, has taught math in adult basic education settings for more than 15 years. She is the New England representative for the Adult Numeracy Network, NCSALL's Practitioner Research and Dissemination Network (PDRN) leader for Maine, and recently was awarded Maine's Adult Education Teacher of the Year award. She is passionate about mathematics and seeks to instill this passion in each of her students.❖

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Focus on Basics Electronic Discussion List

Focus on Basics electronic discussion list serves as an electronic forum for discussion about the articles published in *Focus on Basics*. It is intended as a place to converse with colleagues about the themes examined in the publication; to get questions answered and to pose them; to critique issues raised in the publication; and to share relevant experiences and resources.

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Look Before You Leap: Helping Prospective Learners Make Informed Educational Choices

by Marti Giese

I work in a high school completion program in Fairfax County, VA, a densely populated county adjacent to Washington, D.C. Our program offers three different options for adults interested in finishing their secondary education. One option is our adult high school, where learners can finish the courses required for a diploma or can choose from several options of independent study to complete their coursework. A second option is our General Educational Development (GED) program, which offers monthly testing and free preparation through our network of learning centers throughout the county. These open-entry learning centers offer assessment and self-paced study to adults who wish to improve their skills in reading, writing, math, social studies, and language arts. A third option is our external diploma program, which allows adults over 21 to earn a diploma through demonstration of competencies based on life skills. In this program adult learners meet first with advisors who identify the competencies needed and then with assessors who evaluate the competencies learned. The meetings continue as long as necessary. Each of the three options is designed to meet different learning preferences, time lines, and lifestyles.

Understanding the differences between options and determining which will best suit one's needs requires careful analysis.

Over the past few years I have noticed that many learners enroll in an option without making a thorough comparison of the programs to understand which would be best for them. Mismatches often occur between adult learners and the programs in which they choose to enroll. As a result, learners lose motivation and sometimes drop out. For example, many adult learners choose the well-known GED program without taking a closer look at the other two options. Some of these enrollees have only a couple of courses to take and could more quickly and easily attain their goal by enrolling in our adult high school. Some do not like to take tests. They tend to put off taking the GED test and lose the motivation to complete the program. Others lose motivation because they are unable to focus for the eight-hour GED exam, as it is most commonly offered in our county. These learners find themselves taking the test several times with disappointing results. Others choose to join one of our learning centers to prepare for the GED test, and eventually lose interest because their work schedules and childcare issues do not allow them to attend with enough regularity to make progress. Over time, they too, stop coming.

I believed that these adult learners needed to become more active in their decisionmaking about how to complete their high school education. If they asked more personal questions about each of the options, they could gather enough information to make a program choice based on their specific needs. I wondered how I could motivate prospective students to do this.

A workshop on discovery learning led by Ed Vitale, a consultant and curriculum specialist for Virginia's Workforce Improvement Network, interested me in the motivating power of group research. I did some background reading, including Ira Shor's *Empowering Education – Critical Teaching for Social Change* (1992) and Michael Pritza's "Getting Into Groups" (1998). This strengthened my belief that working together in small groups to gather information and make comparisons would help motivate prospective students to ask more questions to get the information they needed for their individual circumstances. I also hoped it would encourage them to discuss and evaluate what might and might not work for them.

A few months later I joined The Virginia Adult Education Research Network, which is coordinated by Ronna Spacone. In this program, groups of teachers, tutors, and administrators from around the state learn about qualitative inquiry methods so they can explore issues from their practice. After doing some reading about qualitative research (see boxed bibliography on page 14) and participating in some discussions, I formulated the following research question: What happens when adult students engage in group learning to research high school completion options?

Project Design

I knew an orientation to our

"Mismatches often occur between adult learners and the programs in which they choose to enroll. As a result, learners lose motivation and sometimes drop out."

programs would have to accommodate an extremely diverse group of people, from those who could read and write little English to those near readiness to qualify for an American high school diploma. Since our orientations are given in a variety of locations, the procedure would have to appeal to learners in a jail, in a community development program, and in our community learning centers as well. These orientation activities would have to be nonthreatening enough to engage the timid and the confident alike.

Colleague Donna Chambers and I designed and developed a three-session, six-hour orientation workshop that led small groups of adult learners through a series of research activities intended to promote the skills involved in asking questions. Our workshop provided a process: a progression of group activities intended to enable the group to do research and discover the information about each option for itself. We ran the three-session orientation workshop six times in all, totaling 60 participants. Four of the orientations were held in our community learning centers, some during the day and some during the evening, where a mix of new and continuing enrollees attends. Almost all of these students were preparing initially to take the GED test. We ran a fifth orientation at the Pre-Release Center, a program of Fairfax County Detention Center. These participants were also preparing for the GED test. We offered the sixth orientation at a community development program where mostly non-native speakers of English, who are not involved in our high school completion program, come to learn about resources available to them in our community.

In session one of each of the orientation workshops, ten adults got to know each other, talked about their reasons for pursuing an education, and came up with a list of questions against which to compare the three high school completion options. At the end of the session, we organized them randomly into three research teams, gave each team a research topic — one of the program options — and offered the teams an array of printed materials about the programs. The participants were free to select and read any or all of the materials we offered.

During the second session we met in a computer lab to explore the Internet as a tool for researching each of the three high school completion program options. We gave the participants the Fairfax County Public Schools web site as a point of origin. We then explained the use of sidebars and tool bar buttons so they could locate information about each of the high school completion programs. Participants were encouraged to use the telephone in the computer lab to call the program offices for information they were unable to locate on the Internet or in the pamphlets and brochures they had chosen.

In the third session each research team reported on what it had learned about its assigned high school completion option to the other two teams and the facilitators. Each presentation was followed by questions from the audience about how the program option described would suit specific personal needs.

During the weeks of the orientation workshops, my colleague and I kept journals in which we made a simple division between observations and reflections. We gave forms with these headings to teachers, tutors, and administrators who watched the process as well. After each session we collected the forms. We consulted the adult learners in the workshop by asking a series of questions at the end of each session that focussed on what they had learned and how they felt about the activities in which they had participated. At the end of the orientation, we asked the learners to fill out forms evaluating the effect of the entire workshop.

Findings

Because our approach focussed on process and relied on the learners to discover the information they needed, each of the six orientation workshops produced slightly different results. All of the groups, however, came away with an understanding of the differences between program options. During the orientation for students from the jail, for example, participants focussed on which program would best support them in the future, when they were no longer incarcerated. The mothers in the community development project discussed how they could juggle family responsibilities with pursuing an education. In the orientations at the community learning centers, participants talked about the content from the perspective of future employment and possible entry into a community college. The participants explored and discussed the information of personal interest and concern; each prospective

student was able to learn what he or she needed. The facilitators did not take responsibility for figuring out who needed what.

The workshop activities provided an avenue for participants to engage in their research with enthusiasm. One observing administrator was surprised that a mother recently arrived in this country was willing to leave her two preschoolers with a woman she scarcely knew so that she could continue to attend our sessions. An inmate from the jail volunteered that he regretted having missed the first session. Several people from the community learning centers asked why they had not been given this workshop before. By the second session, learners took ownership of their research. By making phone calls and going to the local library to use the Internet, some students voluntarily continued their research outside of class. One man remarked, "I feel responsible because you are making me do the work."

In all the locations where we held the orientation workshops, a sense of commitment to the research groups developed. A teacher at the jail said, "There was a sense of responsibility and 'connectedness' in the group...In fact, one of the members had a terrible migraine headache, yet he stayed for the session because he didn't want to let his group down." At the community development program office an observing administrator remarked that it was wonderful to see a second-year learner take responsibility for a newcomer. At one of the community learning centers, participants left the room after the third session with reluctance. Each stopped outside the door to wait for the rest of the group to emerge. The whole group stayed together, talking and laughing all the way down the hall.

When we provided the orientation at our existing learning centers, participants began to interact more and different pattern of classroom relationships began to emerge. One observer of the process summed it up: "One of the more boisterous students became more subdued ...he was not the center of attention that he normally likes to be.The circle arrangement and group participation took away his power ...and there was participation by those who usually feel shy, withdrawn or intimidated by the more vocal students." Instead of looking to the facilitator for help, group members looked to each other for support. In this way, everybody became a teacher, and everybody learned.

Other patterns of thinking and acting changed as well. One very shy and withdrawn learner who came from a social center surprised us all by participating enthusiastically. Another quiet young man beamed about his accomplishment of making a phone call to gather information. He said people usually hang up on him when he uses the phone because they become impatient with his stuttering. One inmate remarked, "Since last week I learned that being a full time college student isn't such a bad idea...until this, I figured that it just wasn't for me."

From this new-found sense of community support came surprising statements of self-awareness, thoughts that could change attitudes, and quite possibly, change lives. Here are some examples: "I am learning a little bit about myself like I need to further my education because if I don't, I will not have a good job to support my family." "What I am learning about myself is that I'm not as dumb as I thought I was and if I put my mind to it, I can accomplish just about anything." "What I am learning from this session is that distractions keep me from focussing fully on my objective...[I] need to grow up and realize what's real important. That's what I've learned."

"...we are encouraged to find that when learners formulate and answer their own questions, they use this knowledge to make appropriate choices."

Inspired

As a facilitator of growth, I was excited and inspired by results such as these. As a teacher, I wanted to know that I helped the participants develop some of the learning skills they need for the future. I asked each of them at the end of the six-hour workshop, "What have you learned through our work together?" They told me, "I learned that to work in groups is very important, rather than try to get all the information by myself." "It made me realize that the telephone, the computer, and printed information is there to help me learn." "The most important things I learned was how to make a list of questions, how to look for information, and these will help me make my decisions."

At the end of the orientation workshops, several prospective learners chose to enroll in the External Diploma Program and others entered the adult high school. One participant left the orientation excitedly midsession to go straight to the adult high school office to register when he realized how easy it was going to be to finish. Most of the participants voiced the wish that they had learned the information sooner.

This project lasted six months and offers encouragement that adult learners can be taught and motivated to ask more personalized questions about each of the program options during orientations. Furthermore, we are encouraged to find that when learners formulate and answer their own questions, they use this knowledge to make appropriate choices.

Conclusions

We saw that the research methods we used during the orientation workshop allowed adult learners to get involved and encouraged them to take responsibility for their own learning. Their many individual questions suggested that they were personalizing the information they received. The sense of community also helped adults feel comfortable enough to guide each other. Those who were able to explain, guide, or support, did. Those who needed to learn these skills could do so by watching others in their group. Those who were able to organize a plan of action demonstrated the skills for those who needed to learn it. Everybody supported the group goal in some way.

In this atmosphere it seemed that everybody was a teacher as well as a student. Participants learned about more than the three high school completion options available to them in Fairfax County. They learned to rely on themselves and others to gather information. They also learned to extend their reach for more information through the use of technology.

Based on results from this research project, Ronna and I recommended a full-scale program change. It includes a single point of entry for adult learners in the Adult High School Completion Program combined with a multisession orientation program that encourages personalized questions through working in small groups to research our three program options. The full-scale program change is now being designed.

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About the Author

Marti Giese coordinates group contract services for Fairfax County Public Schools, where she develops site-based, workforce, and workplace training programs for local businesses and community agencies. The programs she provides include adult basic education, high school completion, English for speakers of other languages, and an array of classes in computer skills, trade and industry skills, workforce readiness, and workplace improvement.❖

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Do the Cognitive Skills of Dropouts Matter in the Labor Market?

Results from a study of GED attempters in two states

by John H. Tyler

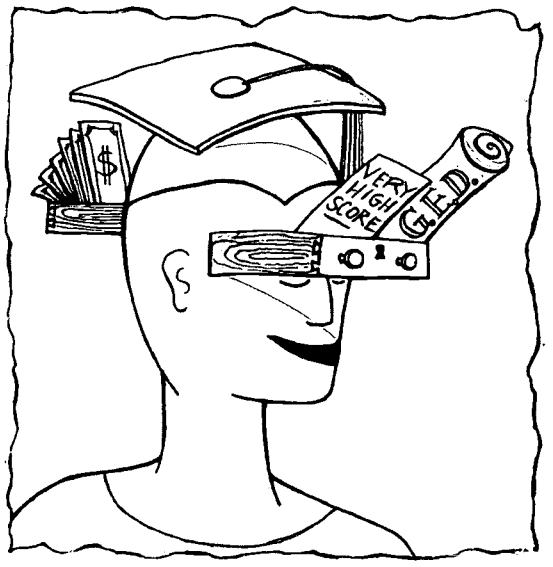
Does the US labor market reward cognitive skill differences among high school dropouts, who are the members of the labor force with the least formal education? [1] ***That is, does it matter how well young dropouts can read, write, and manipulate numbers? The answer is not obvious.***

We know that skill differences among more highly educated groups translate into large wage differences. For example, most analysts believe that the observed increases in the [financial] returns to a college degree relative to a high school diploma represent increased returns to the extra skills possessed by college graduates (Blackburn et al., 1993; Bound & Johnson, 1992; Juhn et al., 1993; Katz & Murphy, 1992). If the economy rewards differences in skills among more highly educated groups, perhaps it rewards differences in skills among all groups: higher skills mean higher wages.

We also know that these same economic trends have depressed the average earnings of the less skilled (Levy & Murnane, 1992). For the young, this may be because the economy has relegated most young dropouts to entry-level jobs where skills matter very little and consequently are not rewarded.

There is a third possibility. The earnings of male dropouts of color in 1996 averaged 28 percent less than those of white male dropouts. [2] Thus, it could be that skills matter for dropouts, but the extent to which they matter is a function of race/ethnicity and/or gender.

These possibilities raise two important questions for research. Do cognitive skills matter for dropouts? If skills are important determinants of earnings for dropouts, do the returns to cognitive skills vary by race/ethnicity and/or gender?



Teachers of adult basic education classes immediately recognize the importance of the answers to these questions. After all, surely one desired outcome for many of their students is the ability to get a job that pays a living wage. It would be a depressing finding indeed if the skills learned through hard work in adult basic education (ABE) and General Educational Development (GED) classes did not translate into positive outcomes in the labor market. I have taken up these questions in collaboration with Richard J. Murnane and John B. Willett of the Harvard Graduate School of Education. Using a unique data source containing GED test scores and demographics merged with Social Security earnings data, we have examined the skills–earnings relationship for a large group of young dropouts in Florida and New York who all attempted the GED exams. This article is a summary of that research. The complete work will be available from NCSALL upon its release.

Our results are both encouraging and troubling. Encouraging is our finding that skills are tightly related to earnings, even for very-low-skilled dropouts: those who were unable to pass the GED exams. The message is that what you learn in formal school and in ABE courses does matter in the labor market. More troublesome is our finding that the annual earnings of young dropouts are very low: around $10,000 annually for male dropouts who were age 21 to 26 in 1995 and $7,500 annually for female dropouts of the same age. We base these findings on dropouts who last attempted the GED exams in Florida and New York between 1986 and 1990. Our data contain both the successful and the unsuccessful GED candidates in those states and years. The passing standard in both of these states during this time was a minimum score on the five GED exams of at least 40 coupled with a mean score on the five exams of at least 45. The individuals in our study were age 16 to 21 at the time they attempted the GED, and we looked at their earnings five years later, whether or not they passed the GED exams. Thus, our earnings

figures are based on earnings in the years 1991 to 1995. We use the GED test scores of these dropouts as our measure of cognitive skills.

Simply put, our research question is: do dropouts with higher GED test scores tend to earn more five years later than similar dropouts with lower GED scores? Our answer is an unequivocal yes. Our results indicate quite large earnings returns to cognitive skills for both male and female dropouts, and for white and dropouts of color. We also find that the earnings payoff to skills increases with age.

We found that regardless of race/ethnicity or gender, individuals who score in the upper ranges of the GED exams earn substantially more five years after attempting the GED than do individuals who score substantially lower on the tests. Some of this difference could be because those with higher scores have a GED, while those with much lower scores do not. Previous research we have conducted suggests that there are labor market returns to the GED credential itself (Tyler et al., 1999).

Test Failers

To eliminate any effect of the GED on earnings from our estimates, we first looked at the group of candidates who did not receive a GED, separately by race/ethnicity and gender. We found that among dropouts who scored so low that they did not pass the GED, those with higher GED test scores (but no GED) tended to have annual earnings about $1,000 higher per year than nonpassers with lower test scores. This represents about a 10 percent gain in earnings. This was true for all groups except for white females, among whom we found no differences between high and low scorers. Not only is a 10 percent gain in earnings substantial, but also keep in mind the small score differences we were using. Our "high" scorers in this group were those whose minimum score among the five GED tests was between 40 and 44, while "low" scorers had minimum scores between 20 and 34.

Test Passers

Next, we looked at the group of candidates who did receive a GED. Among passing GED candidates we found similar returns to cognitive skills five years after the GED attempt. Those GED holders with high GED test scores (minimum test scores 49 or higher) earn $900 to $1,400 more per year than do GED holders with lower test scores (minimum test scores 45 to 48). (Again, this is around a 10 percent gain in earnings.) We find these types of returns for all groups except white males, among whom we found no statistically discernable returns to skills.

So in most cases cognitive skills do matter in the labor market, whether or not a dropout has a GED. Furthermore, these findings are most consistent for dropouts of color. We found these types of returns to skills to be much lower when we looked only one year after the GED attempt. This fits the notion that it may take time for employees to demonstrate their skills in the labor market or for employers to learn about the skills of their employees.

As I mentioned at the beginning of this article, the less optimistic news is that earnings of these young dropouts are very low to begin with. Male dropouts age 21 to 26 have annual earnings of only about $10,000, while the earnings of young female dropouts are about $2,500 lower. It is important to understand that these average earnings figures include individuals who report zero earnings for the year. Thus, they are a measure of the types of wages these dropouts are receiving *and* whether or not they are working at all.

We ask "What is happening to dropouts in this economy?" The answer we bring is that in this age of computers, the Internet, and high-tech jobs, the skills that dropouts bring to the labor market do matter very much. This does not mean that acquiring a GED makes a dropout "information age ready." It means that it matters what skills you have when you drop out, and it matters what you learn between the time you drop out and the time you look for a job.

Notes

1 In our definition, cognitive skills are not immutable, but can be changed through education and experience.

2 Author's tabulation of Current Population Survey data.

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John Tyler is an Assistant Professor of Education, Economics, and Public Policy at Brown University. For the last four years he has been conducting research that examines the roles played by skills and credentials such as the GED in affecting the labor market outcomes of school dropouts.❖

The Relationship Between Reading and Speaking Skills

An interview with Ann Hilferty

by Barbara Garner

Ann Hilferty, Assistant Professor of English at the Massachusetts College of Pharmacy and Health Sciences, has been exploring the research literature on the relationship between the development of reading and speaking skills, especially with adult English for speakers of other languages (ESOL) learners. While she assumes that oral mastery, when it exists, influences reading, she finds that much recent research reveals the influence of reading on speaking. There also seems to be reciprocity between them, which may have implications for ESOL instruction. **Focus on Basics** ***editor Barbara Garner interviewed her to learn more.***

BG: *What do you mean by reciprocity between reading and oral language?*

AH: By reciprocity I mean that as skills in some aspect of oral language increase, they help development in reading, and as a person improves his reading skills, that improvement seems to enhance further improvement in the spoken language. This seems to be a continuing spiral.

I became interested in this because some adult ESOL teachers don't seem to think that it is true. They seem to think there's somewhat of a one-way influence: that development in spoken language influences development of reading. That's true, but it's also true that as people develop stronger reading skills, they further enable their development of more sophisticated speaking skills.

BG: *Where does your sense of ESOL teachers' beliefs come from?*

AH: In a small survey I did a few years ago, many of the teachers seemed to feel strongly that there was a theory supporting the primacy of the spoken language. The word "transfer" came up a lot. Some people seemed to believe that a person only had to reach a certain level of oral proficiency in English and reading proficiency would automatically develop if they were already literate in their first language. My guess is that the teachers were influenced by early 1970s Goodman and Smith articles [on what came to be known as whole language]. Goodman and Smith became very influential in the ESOL community, even when the reading community began to contest their ideas regarding the acquisition of beginning reading skills.

I later tested 44 Latinos who had, in general, fairly high literacy in Spanish, but not a lot of exposure to written English in their ESOL instruction. Their performance on English tests was quite low. They didn't do well in reading in English. There is clearly some transfer [from reading in the first language to reading in the second] but I'm not sure how much. It's not something that automatically happens. If you withhold exposure to practice in English reading and writing until the learners have advanced oral proficiency, you're withholding the very practice they need to improve.

BG: *What are some of the main research findings that reflect reciprocity?*

AH: Some of the most convincing findings are reported in a number of studies. Phonemic awareness — noticing the individual sounds in word — seems to help with comprehension of the spoken language. Knowledge of spelling patterns seems to help improve pronunciation and listening. Print experience is related to knowledge of grammar and print experience also seems to help learners acquire spoken language forms, for example, function words, such as conjunctions, prepositions and articles, and derivational word endings, which are endings that form new words.

BG: *An example of derivational word endings?*

AH: Photographer, photography, photographic.

At the same time, research has shown that we don't speak the way we thought we did. Our model of speech mimicked our model of reading: that we spoke by producing sequences of phonemes. But now we know that it doesn't work like that. That's one of the reasons it's difficult to learn to read.

BG: *So you're saying that there's a firm basis to teach the two — oral and reading skills in a second language — simultaneously and not to neglect one for the other?*

AH: Yes. And many of the same people who are seeing the connections between speaking and reading also report that beginning reading needs instruction. Under normal circumstances, we all learn to speak. But we don't all, under normal circumstances, without any instruction, learn to read.

The research suggests that in the early stages of beginning reading in a

second language accurate and fast word recognition is a good predictor of reading comprehension. You might say that instead of [reading] being dependent on speech, both speech and reading are dependent on the same group of abilities needed to process phonologically difficult materials. Evidence for this is that most reading difficulties reside in phonological language difficulties. Poor readers tend also to have poor speech perception, and phonological deficits in both spoken and written language.

Beginning readers need to learn phonological awareness: awareness of the sound system; and graphophonic awareness: a knowledge of the letters and an understanding that letters and letter combinations stand for sounds and words. If people are only doing oral skills, it might not include much attention to the elements of the sounds of the language — the bits and pieces — even if they do some work on pronunciation.

After the early stages of reading, the relationships [between speech and reading] may change, depending on learner, task, and circumstances. There is evidence, for example, that while for first-language readers' oral experience is primary, reading and writing become increasingly independent and reciprocal as they develop. For some second-language or foreign-language readers, the reading skills provide the bulk of the new language input.

Most studies of adult literacy indicate that phonemic awareness is dependent on letter-sound knowledge. For example, phonemic awareness usually begins to develop in illiterate adults after they have actually had experience with printed letters. Even the concept of "word" is usually not learned until the learner experiences words in print, separated from each other by spaces. As phonological awareness develops, it helps both first- and second-language learners to understand spoken language better.

BG: *What could teachers do to support this reciprocity?*

AH: I didn't read a lot of instructional research, but we do know that phonological and graphophonic awareness develop in a sequence. Steve Stahl confirmed this for both children and adults. These steps can be supported.

BG: *What are the steps?*

AH: Knowledge of the alphabet; phoneme identity (sounds of a language); partial word segmentation (divide a word into syllables, or into onsets and rimes — the first consonant group and the ending, if it's a one syllable word); recognition of some letter sounds in words; simple word recognition; phoneme blending and deletion and full word segmentation (not just syllables but phonemes); advanced word recognition (multisyllablic words, demonstrating less frequent spelling patterns).

BG: *Who are some of the researchers working in this area?*

AH: Just a few of the names that come to mind: Linnea Ehri, Beatrice DeGelder and Jose Morais, Maria Carlo, Charles Read, Lenore Ganschow, James Flege, John Strucker and Rosalind Davidson.

BG: *What kind of classroom research could an interested teacher do to explore these ideas?*

AH: One suggestion might be for teachers to design classroom research projects following some of the recommendations researchers are making for beginning reading instruction. For example, teachers might include sequenced instruction and practice, for those students who need it, in phonemic awareness, alphabet knowledge, and knowledge of the simple English spelling patterns. Teachers can adapt the materials for this from their regular lessons. Then, measuring and recording the students' progress in these skills, teachers might look for relationships with progress in other language skills, both oral and written.

BG: I hope we hear from teachers who try this out.

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Compiled by Ann Hilferty

Supports and Hindrances: A Force-Field Analysis

by Andrea Parrella

The following activity guides a group of learners in thinking about the forces that hinder and help them to achieve their goals. For beginning English for speakers of other languages (ESOL) students, you might need to explain or demonstrate vocabulary.

Step 1: Ask the learners to think about what it takes for them to continue to pursue their educational goals.

Step 2: Write "Pursuing Educational Goals" at the top of a large sheet of paper on the wall. Then, draw a vertical line down the middle of the paper, and write "+" (plus sign) over the left-hand column and "-" (minus sign) over the right-hand column.

Step 3: Ask the learners to brainstorm all of the things that make it hard for them to stay in the program and continue to pursue their educational goals. As they brainstorm forces, write them, one by one, on the right side of the paper, under the minus sign. Use the question: *Who or what gets in the way of (hinders you from) continuing to come to this program?*

Step 4: Ask the learners to brainstorm the things that help them to attend class or to continue to pursue their education goals. Write these on the left side of the paper, under the plus sign. Use the question: *Who or what helps you (supports you) to continue to stay in this program?*

Step 5: Ask the learners to look at the lists and talk about what they see. Are there more negative than positive forces? Where do the forces come from (the class, family, work, etc.)?

Step 6: Give each learner an index card or a blank piece of paper and ask each to write down the answer to this question: *What two forces from the list do you most want us to work on in class?* Point out that they can take their forces either from the positive "+" force list *(forces they would want to work on strengthening)*, from the negative "-" force list *(forces they would want to work on weakening)*, or from a combination of the two.

Step 7: Have the learners get into pairs and discuss the forces they have written down. They must reduce the number of forces from four (two each) to the two they feel are most important to work on in class. One person in each pair should write the new list of two forces on a piece of paper.

Step 8: Have sets of pairs join to form small groups of four. Each pair shares its list of two items with the other pair. The group of four now has several minutes to come up with a new list of two forces on which all four agree. They write their new list of two forces, which represents their "consensus," on a large piece of paper.

Step 9: Ask a member from each group to post the paper with their two forces written on it, reading the forces aloud as they do so. Then ask the whole class to look at the papers for similarities: *Are there any forces that appear on all the lists?* If so, write them on a fresh sheet of paper. These represent the consensus of the class.

Step 10: Continue looking for forces that appear on more than one list until all the forces listed on more than one sheet are on the "consensus" list. Ask the class to consider which items still remaining on the original lists are important enough to include on the fresh list. The fresh list represents the forces that the class wants to work on in the coming term.

Step 11: If only two forces are listed on the "consensus" sheet, skip to step 12. If there are more than two forces, have the learners vote for the two forces they see as the highest priority.

Step 12: The class has now determined the two forces that they most want to work on. The next step is to brainstorm the various ways in which you can work together as a class to address these forces by strengthening the positive and weakening the negative.

Continuing the Process: This is just one way you can help learners understand what is helping them achieve their goals and what is hindering them from doing so. You, of course, will be learning at the same time. Try to set aside some time each week to work, as a class, on strengthening the supporting forces and weakening the hindering forces. You and the learners can assess what effect these activities are having. The forces that the learners want to work on may change over time. To capture these changes, repeat the force-field activity with the class or with individuals throughout the semester.

About the Author

Andrea Parrella worked for two years on the NCSALL Learner Persistence Study.❖

BLACKBOARD

Resources on Learner Persistence

• *Beyond the GED: Making Conscious Choices About the GED and Your Future*, a set of materials for GED teachers, is now available from NCSALL. Written by GED teacher Sara Fass and *Focus on Basics* editor Barbara Garner, and piloted by Sara in her class, the materials consist of three units: "The Labor Market," "Pursuing Higher Education, "and "What the Research Tells Us." (Program staff may want to use the unit "What the Research Tells Us," which synthesizes research on the economic impact of the GED, as a starting point for discussions in a staff meeting.) Lesson plans, reading materials, and handouts are provided.

To order a copy, send a request with a check for $5 to cover photocopying and mailing to Sam Gordenstein, World Education, 44 Farnsworth Street, Boston, MA 02210-1211. Please include contact information such as phone number or e-mail address. We hope to make it available on the web in the future and will announce its availability in *Focus on Basics.*

Resources on Impact of the GED

• *Persistence Among Adult Basic Education Students in Pre-GED Classes* by John Comings, Lisa Soricone, and Andrea Parrella, NCSALL Report #12, is available for $10 from Sam Gordenstein, World Education, 44 Farnsworth Street, Boston, MA 02210-1211. Please include contact information such as phone number or e-mail address.

• The following publications on the topic of learner motivation and persistence can now be reviewed, in draft form, at your State Literacy Resource Center.

• *NCSALL Study Circle Guide: Learner Persistence in Adult Basic Education*
• *NCSALL Staff Development on Learner Motivation, Retention and Persistence: Strategies Packet*
• *NCSALL Training on Learner Motivation, Retention and Persistence: Facilitator's Guide*
• *NCSALL Mentor Teacher Group on Learner Motivation, Retention and Persistence: Facilitator's Guide*

These publications will be available for purchase from NCSALL by February 2001. The exact publication dates will be posted in an upcoming issue of *Focus on Basics.*

• Volume 2, Issue A, March 1998, of *Focus on Basics* was devoted to learner motivation. It can be downloaded from the NCSALL web site at gseweb.harvard.edu/~ncsall. To order a printed copy, send a request with a check for $2 to Mark Holmes, World Education, 44 Farnsworth Street, Boston, MA 02210-1211. Please include contact information such as phone number or e-mail address.

NCSALL Report Available

• Another new NCSALL Report, #11, has been published. *Changes in Learners' Lives One Year After Enrollment in Literacy Programs* by Mary Beth Bingman, Olga Ebert, and Michael Smith is available for $10 from Sam Gordenstein, World Education, 44 Farnsworth Street, Boston, MA 02210-1211. Please include contact information such as phone number or e-mail address.

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MATHEMATICS INSTRUCTION

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Developing Adults' Numerate Thinking: Getting Out From Under the Workbooks

The author makes a case for substantive change in how and what we teach in mathematics

by Mary Jane Schmitt

The standard-bearer of basic math instruction in adult basic education (ABE) and preparation for the tests of General Educational Development (GED) has long been the consumable student workbook. It is not hard to understand why. Workbooks are relatively inexpensive. They are logically incremental and modular, usually with one or two pages devoted to a narrow topic. They place minimal demand on teachers by posing no open-ended questions or investigations; rather, each problem has one and only one right answer, which can be readily checked by the student in the back of the book. For the most part, the mathematics

Continued on page 3

Focus on Basics is the quarterly publication of the National Center for the Study of Adult Learning and Literacy. It presents best practices, current research on adult learning and literacy, and how research is used by adult basic education teachers, counselors, program administrators, and policymakers. *Focus on Basics* is dedicated to connecting research with practice, to connecting teachers with research and researchers with the reality of the classroom, and by doing so, making adult basic education research more relevant to the field.

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WORLD EDUCATION

Welcome to *Focus on Basics*

Dear Readers,

It seems auspicious to be publishing the mathematics instruction issue of *Focus on Basics* at this time. The National Council of Teachers of Mathematics recently issued its revised *Principles and Standards for School Mathematics*. This past summer, NCSALL cosponsored an international mathematics conference. The General Educational Development Testing Service is poised to release the GED 2002, which includes a math test that requires the use of calculators and encourages estimation and problem-solving. These events and others that Mary Jane Schmitt documents in her eloquent argument in our cover article indicate that the time for change in the nature of mathematics instruction may have arrived.

To help math teachers develop a theoretical background for their instructional choices, mathematics teacher and researcher Kathy Safford provides us with an overview of current theories in math education, and a few steps that teachers can follow to deepen their knowledge. Her article begins on page 6.

Learning disabilities specialist Rochelle Kenyon describes dyscalculia, a learning disability specific to math, and provides strategies for mathematics teachers to use when working with learning-disabled math students, whether the disabilities be dyscalculia or reading-related. In addition, she provides a list of resources from which we can learn more. Turn to page 24 for this information.

Linda Huntington, who teaches learning-disabled math students, and Catherine Cantrell, a technology specialist and staff developer, work with learners who are at opposite ends of the educational spectrum. Regardless of the differences in their students' abilities, the same theme emerges in these teachers' accounts of their classrooms: Math must be relevant. Lessons should be developed around math that springs from the learners' lives. These stories begin on pages 28 and 21.

Adult basic education learners around the world want relevant math content. Aydin Yücesan Durgunoğlu and Banu Öney did research on the impact participation had on learners in a basic education program in Istanbul, Turkey. They found that learners had strong emotional reactions to learning mathematics skills that helped them make sense of the world. They share their findings with us in the story that begins on page 18.

Those interested in improving their instruction but struggling with how to do so will find ideas in the article that begins on page 11. The Mathematics Exchange Group (MEG) of New York City works from the theory that adult basic education teachers — most of whom, it is safe to say, do not have advanced training in mathematics — need improved knowledge of math as well as a progressive instructional approach. Their model for teacher education is one that can be replicated in communities across the country.

We hope that this issue of *Focus on Basics* proves to be a useful introductory resource for those committed to change in mathematics instruction for learners at all levels of ability.

Sincerely,

Barbara Garner

Barbara Garner
Editor

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Numerate ... *continued from page 1*

content focuses on standard computational rules (algorithms) with whole numbers, fractions, decimals, percentages, and prealgebra. Adults learn paper and pencil computational processes and symbol manipulation on routine repetitive problems. These problems are then followed by "real-life applications" or word problems whose reason for being seems to be that they provide more opportunities to practice the algorithm. As a result, success in the adult education math class is defined as the ability to follow successfully a sequence of rule-based instructions that can be matched to one-step or two-step word problems.

Some may think this affords a benign and reasonable way for adults returning to school to learn math at their own pace, to keep track of where they are, and to feel a sense accomplishment from plowing through pages of a workbook. I disagree. Used as the primary resource, workbooks are anything but benign: they promote not a second chance but a second-rate education for students wanting to learn math. It is second rate because the mathematical demands of the world inhabited by adults are not sufficiently emphasized. Nor do the workbooks take into account the diverse characteristics of learners and how their rich understandings and usable skills develop. And finally, they put forth a restricted view of the learning process itself. Most workbooks implicitly promote a myth that rule-based math is most important, that adults all learn the same way, and that learning happens by transmission. It is a simplistic and erroneous view of the way in which mathematical thinking develops. To improve adult math education in ABE, these three myths need to be seriously challenged.

Challenging the Math Status Quo

A growing of body of work emphatically challenges the ABE/GED math status quo. A group of seven recently published and/or released policy and research documents has the potential of moving us beyond the basics toward a more realistic, flexible, and adult-centered mathematics curriculum. Taken together, these seven serve as a rich resource for updating the mathematical content of adult basic education. None of these documents abandons the "basics" but they do redirect the emphasis on what the basics are. And while their underlying messages are similar, each document contributes uniquely to a new mission for ABE/GED mathematics instruction.

Some of the documents put an emphasis on "adult" in the "lived-in world." The *SCANS Report* (1991) and *Equipped for the Future Content Standards: What Adults Need to Know and Be Able to Do for the 21st Century* (2000) are grounded in data gathered from the workplace and from adults in their roles as workers, parents, and community members. They emphasize mathematics as a tool for decision-making and problem-solving. In these documents, mathematics is the subtext that weaves through the larger picture of adults (as *Equipped for the Future* would put it) gaining access to information, expressing ideas, acting independently, and bridging to the future. Curricula developed within these frameworks tend to present problem situations to which people are expected to bring their full set of skills. In these curricula, isolated mathematics topics are not emphasized. It is never math for math's sake, but math to aid in the accomplishment of a larger task.

Another group of documents is based on theories, research, and practice centered around children's mathematical thinking. The National Council of Teachers of Mathematics' *Principles and Standards for School Mathematics* (2000) and its predecessor, *Curriculum and Evaluation Standards for School Mathematics* (1989), put an emphasis on understanding over rule-based learning in support of the development of problem-solving and decision-making skills. This emphasis is supported by a body of research that draws heavily upon the Piagetian tradition that knowledge requires a process of active construction and the Vygotskian emphasis on sociocultural aspects of learning. These ideas found their way into some adult education math classes when, in 1994, a group of Massachusetts ABE, GED, English for speakers of other languages (ESOL), and workplace education teachers studied the K-12 publication and wrote an adapted version entitled *The Massachusetts ABE Math Standards.* They implemented them in various adult basic education settings (Leonelli & Schwendemen, 1994). Their report provided the basis for the curriculum frameworks adopted by the Massachusetts adult basic education community. Embracing the vision of the NCTM *Standards,* some Massachusetts teachers began to insert new topics and strategies into their classrooms, emphasizing communication, problem-solving, reasoning, and connections to other disciplines.

Other documents also connect "adult" with "developing mathematical thinking." SCANS and *Equipped for the Future* are grounded in considerations of the skills embedded in adult roles; the NCTM documents are situated in research into how children's mathematical thinking develops. Both movements offer important guidance for ABE math education, but neither alone is sufficient. We need to take into account what we know about the mathematical demands on adults as well as what we know about the development of mathematical thinking. One document that draws

from both is the practitioner-developed *A Framework for Adult Numeracy Standards: The Mathematical Skills and Abilities Adults Need To Be Equipped for the Future* (Curry, Schmitt, & Waldron, 1996). Its message is focused directly on ABE and GED programs across the nation about the "honest list" of what adults need to know in math in their roles as workers, parents, and community members. It organizes that list into categories that reflect the mathematics education community.

What About the GED?

That is all well and good, but what about the GED? After all, passing the GED is a major goal of students and thus drives much of mathematics curricula. Adult educators should note that the new *GED 2002-Test Series* is strongly influenced by the NCTM *Standards*. The content of the upcoming test will be aligned, and appropriately so, with the emphasis on algebra and patterns, data analysis and statistics, geometry and measurement, as well as number sense. The inclusion of a scientific calculator as a tool on part of the test symbolically releases ABE from the "drill and kill" of workbooks to more of an emphasis on the importance of estimation and problem-solving. We can look at the new GED as an opportunity for ABE/GED programs to rethink the mathematics curriculum in a way that is not inconsistent with any of the aforementioned documents.

Finally, I will include a document that adds a new wrinkle to the discussion and suggests that the focus for adults should not be on "school math" but on "numeracy." A recent working paper conceptualizing the assessment of numeracy skills in the adult population is part of the international *Adult Literacy and Lifeskills Survey Numeracy Framework Working Draft* (Gal, van Groenestijn, Manly, Schmitt, & Tout, 1999). The paper says that numeracy is the bridge between mathematics and the real world. In considering the mathematical demands that adults are faced with and the skills needed to meet those demands effectively, the authors have arrived at a definition for adult "numerate behavior." Numerate behavior, they posit, is observed when people manage a situation or solve a problem in a real context; it involves responding to information about mathematical ideas that may be represented in a range of ways; it requires the activation of a range of enabling knowledge, behaviors, and processes" (p. 11).

"Putting these two messages together, I propose their summary into a major mission statement for adult basic education: the development of adult numerate thinking."

Numeracy, in this framework, has to do not only with quantity and number but also with dimension and shape, patterns and relationships, data and chance, and the mathematics of change. People identify, interpret, act upon, and communicate about this mathematical information in various ways. The authors — of whom I am one — have attempted to turn this multifaceted definition into test items to be used in a household survey to assess the distribution of skills in the adult populations of participating countries. This treatment of numeracy has the potential to redirect the ABE/GED emphasis from school math to a subject more closely connected to authentic, real-world mathematical demands.

In these seven documents, is there one message or many messages? What kind of coordinated guidance can these documents, taken together, offer adult basic education mathematics instruction? None of them has the full message. Each provides an essential component to help us improve service delivery radically. Taken together, the message that comes through can be summarized as follows:

1. Adult basic education and GED mathematics instruction should be less concerned with school mathematics and more concerned with the mathematical demands of the lived-in world: the demands that adults meet in their roles as workers, family members, and community members. Therefore we need to view this new term *numeracy* not as a synonym for mathematics but as a new discipline defined as the *bridge that links mathematics and the real world.*

2. Adult basic education and GED mathematics instruction need to draw upon what is *known about the development of children's mathematical thinking* and extend that research to address the development of adults' numerate thinking and practice.

Putting these two messages together, I propose their summary into a major mission statement for adult basic education: *the development of adult numerate thinking.*

And so . . .

This brings me back to my opening volley. The ideas represented in these seven documents and *the*

development of adult numerate thinking are systemically under-represented in our instructional materials. They are missing as well in our methods, assessments, teacher development, research agenda, and program and national policies. It is going to take much more than replacing the word math with the word numeracy. It is heartening that the newly proposed National Reporting System (Pelavin Research, 2000) includes a list of *numeracy* skills, but disappointing that the list looks more like the table of contents of a traditional workbook than any of the seven documents. As the workbooks do, the April 2000 draft of the NRS holds adult education accountable for a very limited set of numeracy skills. Adults who come to our programs deserve and need much more. It is my hope that the ABE delivery system can heed their own documents and put the principles into practice. Otherwise the math curriculum in ABE will remain as uninspiring as the table of contents of the nearest workbook.

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FURTHER READING

The seven documents discussed in this article can be found at these web sites.

- *A Framework for Adult Numeracy Standards: The Mathematical Skills and Abilities Adults Need To Be Equipped for the Future* (Adult Numeracy Practitioners Network, 1996):
  http://www.std.com/anpn/framewkTOC.html
- *ALL Numeracy Framework Working Draft* (National Center for Educational Statistics and Statistics Canada, 1999):
  http://nces.ed.gov/ilss/skills_domains.asp#numeracy
- *Equipped for the Future Content Standards: What Adults Need to Know for the 21st Century* (National Institute for Literacy, 2000):
  http://www.nifl.gov/nifl/eff.html
- *GED 2002- Test Series* (American Council on Education, forthcoming):
  http://www.bhef.com/calec/ged/test2002-A.html#test5
- *Massachusetts Adult Basic Education Math Standards* (SABES, Holyoke Community College, 1994):
  http://www2.wgbh.org/MBCWEIS/LTC/CLC/abemathhomepage.html
- *Principles and Standards for School Mathematics* (National Council of Teachers of Mathematics, 2000):
  http://standards-e.nctm.org
- *What Work Requires of Schools: The Report of the Secretary's Commission on Achieving Necessary Skills* (Secretary's Commission on Achieving Necessary Skills, 1991):
  http://www.ttrc.doleta.gov/SCANS

Making Peace in the Math Wars

Safford explores the theories that underlie different approaches to math instruction and envisions a math classroom that captures the positive aspects of them all

by Kathy Safford

A simplistic summary of Newton's Third Law of Motion states that for every action there is an equal and opposite reaction. An observer of mathematics education in the United States over the last 50 years could use the same words to describe the reform movements within that community. This historical roller coaster of theories and practices has shaped the mathematics histories of the adult students we meet in year 2000 classes. As I write this article there is, at every level of institutional education, disagreement about what should be taught, how the learner learns, and, therefore, how the teacher should teach. Like so many debates in the public forum, the participants often speak in terms of all or nothing and the controversy is sometimes bitter and downright nasty. Issues of rigor, exclusivity, and achievement lead to quarrels among even the best-intentioned participants. Perhaps nothing else could be expected of a marriage of theoretical mathematicians and educational psychologists. At the heart of the dispute is the question "What is mathematics?"

The repercussions of this controversy will sculpt the mathematics education we offer to our adult students. I hope to offer here a vision of an adult education math classroom that captures the positive aspects from all sides of the argument, based on my experiences as a math educator and the various educational psychology theories supporting them.

A Personal Journey

I began my mathematics education career in 1984, as the instructor of a community college basic mathematics course that met in the evenings. Because of the time slot, the majority of the students were adults. My teaching style reflected my own experiences in the classrooms of the 1950s and 1960s and was quite traditional. All students taking the basic mathematics course were tested — at a central campus testing center — five times a semester. The tests were multiple choice. My job boiled down to preparing the students to take the tests. In all probability I behaved like the teachers the students had met in their elementary school careers. Except, of course, that I had 45 hours to train them to perform arithmetic (often the word used in the text titles for courses at this level) tasks they had somehow failed to master in nine years of elementary education.

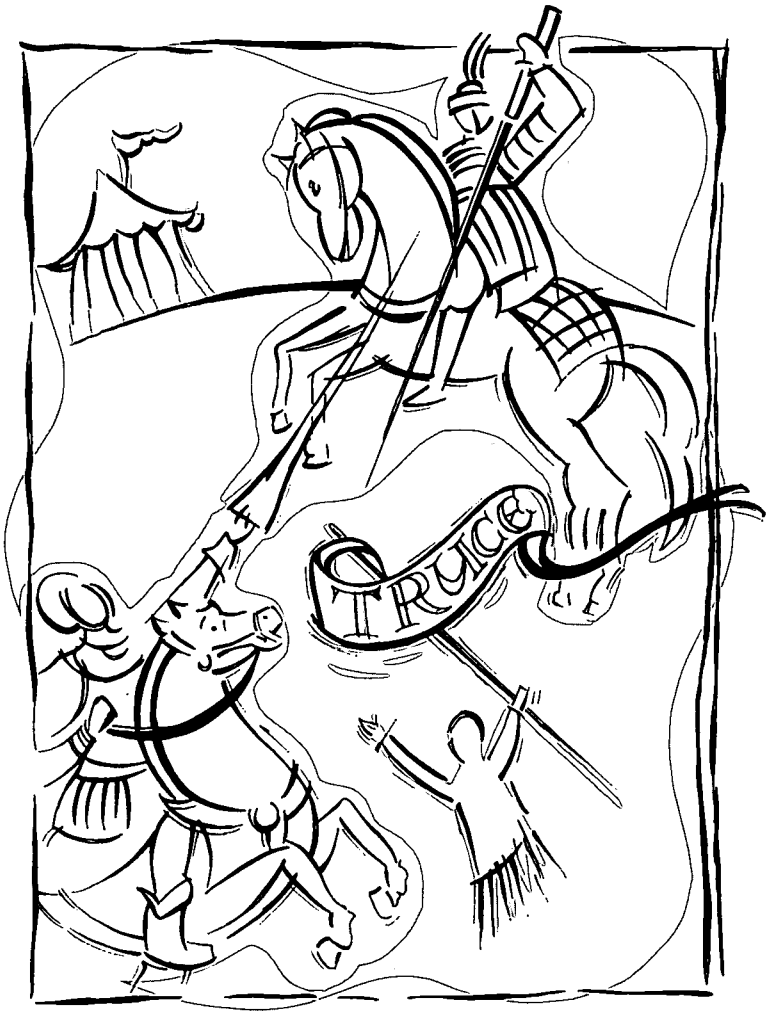
There were success stories. One semester all the students in my elementary algebra course passed the exit exam. Those familiar with developmental classes will realize the achievement that last sentence signifies. Certain doubts, however, continued to plague me. Students were frank in their evaluations of the utility of the skills they had acquired. The college did not allow them to use calculators, and they were expected to memorize the addition facts and multiplication tables during the first week of the class. Responses to that demand ranged from jocularity to open rebellion. Later in the course, when we were attempting to master the division of multiple-place decimal numbers into other multiple-place decimal numbers, one student announced that if she ever did that by hand at work she would be fired for wasting time and risking error. Her boss supplied a calculator that she was expected to use efficiently. Most damning was the inevitable last day of class when students thanked me politely and said that they had enjoyed the course, but had no idea when they would use the material in their "real" lives.

In 1990, I decided to expand my professional horizons and go back to school for a doctorate in either mathematics or mathematics education, settling after much thought upon the latter. The National Council of Teachers of Mathematics' *Standards* were fresh off the presses and Rutgers, the State University of New Jersey, was at the forefront of research on the applicability of constructivism to mathematics education. Constructivist theorists believe that "learners do not just absorb information at face value . . . they actively try to organize and make sense of it, often in unique, idiosyncratic ways" (Ormrod, 1999, p. 171). Like a convert to a new religion, I decided that a constructivist classroom was the way to go. Never again would I train students to perform tasks without understanding them, nor would I teach them rules that could be learned quickly and as quickly forgotten. Fortune provided two opportunities for me to implement these new beliefs. The first chance came via a position as the basic mathematics instructor at a manufacturing plant. The second opportunity came two years later at Rutgers, when the adult college

within the university sanctioned a basic algebra course limited to their students who had been unsuccessful in classes with a predominance of traditional college-aged students. Reflections on these two experiences, as well as consequent immersion in research literature, form the basis of the adult class prototype I suggest here.

The Current Debate

The roots of the recent debate over what content and methods should compose the mathematics education of children, termed the "math wars" by the media, reach back two decades. A pamphlet published by the National Commission on Excellence in Education, entitled *A Nation at Risk* (1983), called for the strengthening of high school graduation requirements in the United States in five subject areas, including three years of mathematics study. Recommended content included the traditional topics of algebra and geometry and additional topics such as elementary probability and statistics. The Commission emphasized that their recommendations were not exclusive to the college bound but extended to mathematics classes for students who would not be continuing their formal education immediately (National Commission on Excellence in Education, 1983). The gauntlet for math education reform was picked up by the National Research Council, which published a trilogy, *Everybody Counts, A Challenge of Numbers,* and *Moving Beyond the Myths,* which addressed different aspects of the perceived problems with US mathematics education and recommended further action to address them.



From the start, the National Council of Teachers of Mathematics (NCTM) was also involved in the reform investigations. NCTM is the principal professional organization for primary and secondary school mathematics teachers in the United States and Canada. Its membership is overwhelmingly, but not exclusively, composed of individuals concerned with pedagogy and the instruction of children and adolescents. In 1989, NCTM released *The Curriculum and Evaluation Standards for School Mathematics.* The intent of the *Standards* was to ensure quality, indicate goals, and promote change (NCTM, 1989). It contained specific suggestions for content and practices that should receive increased or decreased attention from kindergarten through twelfth grade.

While other mathematics organizations have subsequently published documents that address the issues of reform, the NCTM *Standards* are at the center of the current maelstrom. They were first on the scene, made the most specific suggestions, and affected the greatest number of students. Some members of the adult basic education community found the original NCTM *Standards* useful as the basis for standards for their organizations. The Adult Basic Education Math Standards Project in Massachusetts used them as a guideline when composing *The Massachusetts Adult Basic Education Math Standards* (Leonelli & Schwendeman, 1994). The Mathematics Committee Division of Adult and Career Education did the same when writing their *Adult Mathematical Literacy for the 21st Century* (Milner, 1995). I, too, have written both a basic computation course and an introductory algebra course based on the recommendations of the 1989 *Standards.* The original document has been revised, reflecting the experiences of the past ten years, and the new version was released in April, 2000. The revised *Standards*

captures the spirit of the original book while reorganizing and realigning some of the topics. Five content areas are addressed: number and operation; patterns, functions, and algebra; geometry and spatial sense; measurement; and data analysis, statistics, and probability. Cross-content standards of emphasis and methodology include problem-solving, reasoning and proof, communication, connections, and representation (NCTM, 2000).

What, you might ask, is the controversy all about? Superficially, the recommendations for decreased versus increased attention separate the two warring factions. Far more fundamental, however, is the question of how students learn mathematics. The answer to that requires an examination of learning theories and their appropriateness for the study of mathematics. While the NCTM wisely steered clear of endorsing a specific school of thought, the *Standards* do reflect the influence of the theory of constructivism. Much of the theory termed as "constructivist" stems from work by the Swiss psychologist Jean Piaget. The keystone of constructivism is the notion that all knowledge is constructed by individuals who act upon external stimuli and assimilate new experiences by building a knowledge base or altering existing schemas. At its most radical, constructivist theory holds that each person discovers truth and constructs his or her own unique knowledge base (von Glaserfeld, 1991). Constructivist advocates believe that students should explore mathematical situations and induce the general rules of mathematics from those experiences.

Opponents hold the view that students may fail to recognize correct patterns or may construct erroneous rules that will be difficult to deconstruct. Many, though certainly not all, of these individuals learned mathematics in the 1940s and 1950s, when behaviorism was the prevailing learning theory and drill and practice constituted the teaching methodology. A central focus of behaviorism is the observation of a stimulus presented to the research subject and the resultant response. As a result, behaviorism is sometimes called S-R psychology. A simple example from mathematics is the presentation of a problem involving a number fact (the stimulus) and the student reply (response). Learning, in an S-R sense, is considered to have occurred when the correct solution is given consistently. Behaviorists, and their emphasis on observable, measurable phenomena, reflect a general movement at that time toward rigor in the natural sciences, and towards data that could be counted and quantitatively analyzed. B.F. Skinner is perhaps the psychologist who first comes to mind when behaviorism is mentioned. He proposed the ideas of operant conditioning and the use of reinforcement to strengthen a desired response. The methods of operant conditioning can be applied in learning situations to encourage desired behavior as well as to discourage the undesirable (Ormrod, 1999). They are useful in the treatment of anxiety. It is somewhat ironic that our adult students often developed math anxiety because they were unsuccessful in S-R math drills, yet knowledge of operant conditioning can help math educators to plan strategies to decrease and even overcome that anxiety. Course materials that appear different from classes in their past and a supportive classroom atmosphere invite anxious students to lower defensive attitudes that have blocked their previous mathematics learning (Ramus, 1997).

An Adult Class Prototype

While time and experience have moderated my initial zeal for a strict constructivist andragogy — the art and science of teaching adults — it is still the driving theory upon which I believe mathematics instruction should be based. Constructivism is based on the fundamental assumption that people create knowledge from the interaction between their existing knowledge or beliefs and the new ideas or situations they encounter (Airasian & Walsh, 1997). Malcolm Knowles (1978), a pivotal figure in adult learning theory, wrote that as individuals mature they accumulate an expanding reservoir of experience that causes them to become increasingly rich resources for learning, and at the same time provides them with a broadening base to which to relate new learning (p. 56). Adult students bring to the mathematics classroom knowledge of situations that require mathematics as well as methods, sometimes rather ingenious, they have devised to solve problems involving mathematics. In the literature of adult mathematics research these are termed "street math" as opposed to "school math." One role of the instructor is to mediate these two "maths," to aid students in clarifying

Building a Philosophy

If you are new to teaching mathematics, or have been teaching many years without a firm grounding in the theory of mathematics instruction, you may want to follow these suggestions to building a basis for your teaching choices:

- Read the National Council of Teachers of Mathematics *Principles and Standards for School Mathematics*.
- Learn more about the various theories of learning highlighted in this article as well as others that space restrictions precluded.
- Think about the mathematical tasks you and your students perform in your daily lives.
- Read a current mathematics methods text, which will help you to clarify the essence of mathematical operations and number. These will often suggest problems you can alter to reflect adult situations. I like *Elementary and Middle School Mathematics,* by John Van De Walle. Published in 1997 by Addison-Wesley, it gives concepts and methods at the same time.
- Recognize mathematical "moments" in your daily life and start off the class with a problem structured on that experience. A moment might be a sound bite from the news you hear on the way to work, something that happened to you in the supermarket, or a mathematical pattern you noticed.
- Bring in clippings from the newspaper or magazines with graphs or reports of surveys. This year, for example, we will be seeing a lot of census information in the press. Share it with your students and discuss the implications for their community.

The classroom methods suggested here take time and adjustment on the part of the students and instructor. Preconceptions can undermine the establishment of this new learning climate. Students may come to the classroom with a clear vision of the teacher–student relationship. To them, the teacher may be an ultimate source of knowledge and wisdom (Tennant & Pogson, 1995). What Friere terms the "banking concept" of education may be the model they expect, and they may be reluctant to surrender without a struggle (Friere, 1993). Others may feel that the teacher must be a provider and comforter (Tennant & Pogson, 1995). The nature of remembered school experiences may conflict with goals in a class or program that is striving to encourage independent thinking and learning. Adults may need some nudging to become active builders of their own knowledge.

knowledge they already own, and to alter and enhance it with new knowledge acquired in our classrooms.

I try to begin each class with a problem tied to the topic of the day, but one that can be tackled with street skills. For example, how would the student figure out the tip in a restaurant? Since those skills vary, each student, or group of students if the class is working cooperatively, describes their solution strategy and it is recorded on the chalkboard. The class then examines the responses for similarities of solutions and strategies as well as differences. We evaluate and discard incorrect solutions, which often turn out to be correct solutions to a different problem. I guide the learners so that they recognize patterns that are emerging and develop the "rules" of mathematics themselves, in their own language.

Social Learning Theory

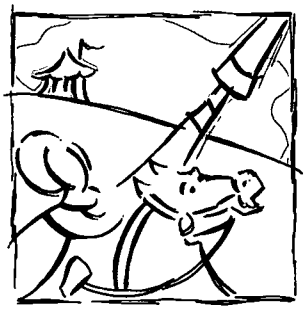
Sometimes no one can solve the problem or everyone is totally off base. Another school of thought, social learning theory, provides me with insight in these instances. One principle that underlies social learning theory is that people can learn by observing the behaviors of others and the outcomes of those behaviors. The work of Lev Vygotsky on "scaffolding" is generally classified as social constructivism (Ormrod, 1999). The process it describes is closely linked to learning from observation. Scaffolding posits that the learner functions as an apprentice to a master, and that there are four stages of learning. The first involves observation of the skilled individual. At the second level, the learner shadows the model, and performs the task simultaneously with the teacher. By the third level, the apprentice is practicing the skill under the watchful eye of the master until the fourth level, at which the master steps aside and allows the apprentice to perform unassisted.

In my teaching, I use scaffolding to teach problem-solving. When I begin teaching a course, I approach word problems by mulling aloud about the situation and organizing the information in a table in a seemingly offhand way. After a few class sessions, I begin to focus on that strategy and involve the students in the process of building the table. If students are rambling in their attempt to solve the problem, I take a direct

approach and suggest that a good way to start organizing the information would be a table. I share with them the utility I have found in this approach. When solutions to problems are solicited, a tabular approach is the focal point of resolving differences. I consider the fourth level is achieved when tables show up on assignments or examinations.

A Role for S/R

In listening to student voices, I have come to realize that S-R theory still has a place in adult mathematics instruction, but that it should be the cart rather than the horse. A major complaint from students about my constructivist stance was the lack of adequate practice of skills and rules constructed during investigations of problems (Ramus, 1997). Repetition and practice hone skills that become automatic, a process termed "automaticity" in cognitive science. This frees working memory to deal with more challenging, nonroutine tasks (Ormrod, 1999). Imagine yourself having to think about the meanings of the colors in traffic lights every time you approach one. Not having to do so frees you to think about pedestrians, the bus ahead, and the myriad other distractions you encounter while driving. If students have constructed and own the rules they are practicing, they can reconstruct them at some later time. Practice diminishes the need for such activity and releases their brains to engage in more constructive work.



Conclusion

The field of adult basic education is broad and that education is delivered in a variety of institutions. In some situations attendance is erratic and individualized instruction more practical than whole-class or small-group work. For others, a multitude of languages and literacy levels make mathematics word problems a challenge. In whole-class settings there may be a great discrepancy of mathematical knowledge among the participants, offering the challenge of meeting everyone's needs without holding some back or leaving others behind. In the box on the previous page, I offer suggestions for building your mathematics program grounded in the theories discussed and based on my own experiences at the task.

While the math wars rage outside our classrooms, we soldier on inside. The last 20 years have brought changes in the content we emphasize in mathematics classes, the tools we use to teach that content, and the methods we use to deliver instruction. This article has attempted to offer a compromise plan to ABE teachers by sharing some strategies for effective math teaching and the learning theories that support good practice. Instructors who are informed of their choices are equipped to design instructional experiences that will assist students towards both personal and credentialing goals.

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The New York City Math Exchange Group

Helping teachers change the way they teach mathematics

By Charles Brover, Denise Deagan, and Solange Farina

Much has been written about reform in math education. The National Council of Teachers of Mathematics (NCTM) is leading an energetic and concerted campaign for reform, yet most math classes and curricula remain decidedly unreformed (Hiebert, 1999). A lack of first-rate math instruction is particularly pronounced in adult basic education (ABE), with its historic mission to teach print literacy. The New York City Mathematics Exchange Group (MEG) is the organizational expression of a limited continuing attempt to change the way math is actually taught and learned in an adult literacy community. We hope our experience may be useful to others searching for a small-scale professional development approach that brings math reform from the lofty pages of academic journals and the high intensity of conferences into the day-to-day work of ABE classrooms.

For the past eight years ABE teachers participating in MEG have been meeting monthly to shake hands, throw dice, examine fruit and vegetables, build bridges, and eat popcorn — that is, to do math. We have been learning to think about mathematics education in a new way.

MEG was the idea of Georgia Salley, a staff developer at the New York City Community Development Agency. She and a small group of teachers from community-based organizations initiated the project in 1992 as a series of workshops for teachers interested in improving mathematics instruction in adult education. The workshops evolved into a teacher collaborative that met on a regular monthly basis to discuss the sorry state of math education in our programs and to imagine ways to make it better. Early MEG meetings were also a place where teachers talked about their own experiences with school math as well as the challenges and joys of teaching math. MEG understood that many teachers carried into the classroom the burden of the alienating experiences of their own math education. Without alternative models of learning math, teachers tended to teach math the way it had been taught to them.

MEG meetings also provided cooperative, hands-on problem-solving experiences through which teachers could construct math knowledge for themselves. One teacher wrote in her journal, "Though I moan and groan about doing math problems, it's probably the best part of the meeting for me. It has allowed me to experience math in a new and different way. I'm finding that it's given me new ways of thinking about and teaching math. It's interesting because now I am beginning to integrate it into my way of teaching."

Another participant wrote, "I always thought math was math and you learned it the way I learned it through pain and agony, like everyone else. Well, I was wrong. Teaching math is a wonderful thing . . . I highlight the students' ability to overcome math instead of math overcoming them."

Thinking about Contradictions

The adult literacy community in New York in the 1990s was an interesting and perhaps unique place in which to work for educational reform. In New York, literacy education programs are staffed mainly with nonunionized, part-time moonlighters whose pay and working conditions reflect the socially marginal position of the students they serve; nevertheless, many of these teachers are professional literacy workers with considerable experience and pedagogical sophistication. Many teachers closely followed and actively participated in the "reading wars" between whole-language advocates and supporters of skills-and-drills phonics-based approaches. A core of teachers settled on a meaning-based approach to literacy learning, and a few programs even described themselves as "whole language." But this intellectually fertilizing discourse did not extend to mathematics instruction.

"But this intellectually fertilizing discourse did not extend to mathematics instruction."

Many of the teachers MEG attracted struggled to make literacy learning meaningfully based upon the

"Despite demands for 'more math' from learners, some teachers who described themselves as 'student-centered' taught no math at all."

experience of their students. However, many of these teachers had given scant consideration to their pedagogic assumptions with regard to mathematics. Many teachers had been drawn to the field of adult basic education as a democratic political project through which they could promote educational equity and access to print literacy for those denied school-based literacy. Nevertheless, they had not fully considered the political and social implications of the congruent denial of adequate math education in an increasingly technologically driven world.

MEG found a curious compartmentalization among many first-rate literacy teachers. The teacher who decried rote memorization and shunned "decontexualized" language learning nevertheless limited math education to "math facts" taught from worksheets. The teacher who was attentive to learners' cultural and language backgrounds and sought to provide learners with meaningful opportunities to learn reading and writing offered abstract and alienating computational drills when it came time to teach the language of mathematics. Teachers who followed the ideas of the Brazilian educator, Paulo Freire, would "problematize" for literacy, but would not put problem-solving at the heart of their math instruction. Despite demands for "more math" from learners, some teachers who described themselves as "student-centered" taught no math at all.

MEG provided a place for teachers to explore these glaring contradictions as we began to consider whether what we knew about literacy learning also applied to math. These discussions often led to questions such as:

- Is math different?
- Why is math seen as abstract, not based in "real life?"
- What does it mean to think mathematically?
- What is the role of the teacher in the mathematics classroom?

One teacher wrote in her journal: "Once again I am confronted by my lack of confidence and fear of taking risks when it comes to math . . . Slowly, very slowly I am willing to play and explore with numbers. It's interesting to see how my traditional math education still intrudes into how I think and feel about math. More and more I see that good teaching that applies in BE [Basic Education]'s reading and writing is also true for math."

By openly recognizing these contradictions, teachers became engaged in the project of changing the way they taught mathematics. Our deeply held pedagogic and political assumptions about education generally helped us to embrace the approach to mathematics advocated by the NCTM's *Principles and Standards for School Mathematics* (2000). The NCTM *Standards* elevate meaning-making in mathematics. They emphasize problem-solving, cooperative learning, and math communication; they affirm the opportunity to learn and equity. What we knew about literacy learning applied also to mathematics. Teachers who previously had not heard of an organization called The National Council of Teachers of Mathematics began to develop math lessons based on the NCTM *Standards* for MEG meetings and their classes. They began to think of themselves as math teachers as well as literacy teachers.

Doing Math—Teaching Math

Becoming a good math teacher is not only a matter of pedagogy, it is also a matter of knowing mathematics. In many programs, adult educators, few of whom come to adult education with a math background or even much interest in math, are expected to teach all subjects to students who range from new readers to students preparing to take the tests of General Educational Development (GED). As MEG organizers quickly discovered, teachers were often as math phobic as their students. They avoided teaching math for the same reasons their students avoided learning it: they hated math. It seemed self-evident that if teachers did not know and do math, they could not teach it effectively. MEG turned its attention to teachers learning math as they

"Becoming a good math teacher is not only a matter of pedagogy, it is also a matter of knowing mathematics."

were learning how to teach it. We did not adopt a strategy of progress by discrete stages: first we would master math content, and only then would we teach it. That was a luxury not supported by the conditions of our work.

"... teachers were often as math phobic as their students."

MEG meetings are now organized around learning and teaching math at the level we are teaching it. We take the NCTM *Standards* as our guide. In MEG's collaborative, problem-solving culture, we seek to connect our experiences learning math with the possibilities for math instruction. With the help of more advanced math thinkers among us, we explore the "big ideas" of basic math and arithmetic embedded in our activities and lessons. As we become deeper mathematical thinkers, we are better able to help our students understand math concepts. Of course, the more mathematics we learn, the more we appreciate the terrible deficiency of math content in ABE programs.

MEG believes problem-solving is central to mathematics instruction. We therefore organize our own learning according to that principle. At each meeting a member or team of members presents a math question or problem appropriate to adult education classes — often drawn from the NCTM *Addenda* books — and guides the discussion. We have a dual goal: (1) to solve problems together, thereby raising our own level of mathematical content knowledge and problem-solving ability, and (2) to explore the implications for math instruction resulting from this process. Teachers with varying levels of experience and comfort with math work together and communicate their reasoning; all involved come away with a deeper understanding of math and more confidence in their ability to bring this understanding to their classrooms. Teachers reflect on how they solved a problem, discuss the math involved, and consider the application to particular levels and classes of learners. The meetings incorporate writing and journaling as part of the reflection process. In her journal one teacher wrote: "Attending the MEG workshops has revolutionized my math teaching. I am using manipulatives in the math lab I facilitate. I am trying to explain less and less, and ask 'Why?' more and more." Often teachers are surprised to learn that there are different ways to solve a problem. A teacher wrote, "I still have to think more about today's problems and try to figure them out for myself. It's always amazing to me that there are several ways of solving them — of course in the bad old days there was only the teacher's way, and that was so limiting . . . I would like to co-teach a math class and use what I learn here."

One meeting engaged the classic question of why the product of two negative numbers is a positive number (see pages 16 and 17). Teachers sat around a table as the facilitator walked around placing piles of red and yellow two-color counters in front of each group. "Why do you think that multiplying a negative integer by a negative integer results in a positive product? I'd like you to take some time with your group to come up with an explanation of why this makes sense." Most groups jumped right into a discussion:

"I remember that rule but I'm not sure why it is true."

"When I learned it, I think I was just given the rule, but no explanation. I guess that is the way I've been teaching it too."

"Maybe it is like using a double negative in language. If I don't have nothing then I have something."

"But that is only true in some languages, and not in others like Spanish."

"I always have to think of this in terms of time and money."

The facilitator begins the activity: "Let's try to solve it using the two-color counters." And the MEG meeting becomes a rich, textured investigation of math content.

Expanding Our Activities

Our monthly meetings have always been the mainstay of our work. We mail detailed minutes of meetings to all members, along with math problems and activities we had worked on. As we gained confidence in our mission, MEG reached out to more practitioners in the New York literacy community. We organized workshops and made yearly presentations at the citywide Adult Basic Education Conference. In 1995, in conjunction with the New York City Professional Development Consortium, MEG offered a four-week math institute that drew participants from all the literacy-providing agencies in the city. In 1997 we began

"MEG believes problem-solving is central to mathematics instruction."

our newsletter, *The Math Exchange,* aimed at an audience unable to attend our meetings. The newsletter chronicles MEG's work, connects the city's literacy community to wider concerns of math education, reports on the national and regional conferences of the NCTM and Adult Numeracy Network, and highlights exemplary practice in math education. Recently MEG meetings have been scheduled at literacy program sites throughout New York City so that we can reach more people in the field. At the York College Learning Center (City University of New York [CUNY]) in Jamaica, Queens, for instance, we have provided a number of on-site workshops and continuing collaboration over the past five years. We are currently working with York College Learning Center to develop standards-based math activities and a Family Math Fair.

> *"Our resources are meager and the task is overwhelming."*

MEG and The Future

How do we evaluate MEG's experience thus far? What impact

Their Standards and Ours

In 1993, MEG began systematic study of the 1989 National Council of Teachers of Mathematics *Standards and Principles*. As we became advocates for the educational values expressed in the document, a broader political discussion ensued within MEG on the topics of equity, access, and the use of standards in high-stakes educational decisions. We knew that many of our students, particularly young adult African-Americans and second-language students, had been excluded from educational opportunity by the use of inappropriate, high-stakes tests administered in the name of standards and academic excellence. We recognized that the word "standards" meant different things to different people. For most policymakers, standards seems to signify an agenda of tougher high-stakes testing. They do not seem to concern themselves with standards focused around adequate resources or equal access to opportunities to learn for all students. Instead, educational equity seems to be limited to all students taking the same test.

The NCTM had something else in mind when they used the words "standards" and "standards-based math education." The NCTM *Standards* outlined a process of learning and teaching that included all students; it emphasized professional development and adequate resources to support math teachers; it advocated multiple assessments for specified outcomes.

Standardized tests are now ubiquitous in US educational institutions. They are the central mechanism in a system of tracking and sorting by social class and race. The tests also drive instruction in the direction of narrowly conceived test preparation. In ABE most students understand that the standardized, norm-referenced tests of General Educational Development (GED) are the gatekeeper to the crown of graduation. In its present version the GED mathematics test emphasizes surface knowledge of school-based math and does not suggest to teachers and students that mathematics knowledge develops within a context of problem-solving and investigation. When the new series debuts in 2002, it may reflect better some of the values encouraged by the NCTM.

But do better assessment instruments by themselves create better instruction? Not without professional development to implement better curriculum adequately. MEG rejects the use of tests to deny access to educational and vocational opportunities for historically marginalized groups. We strongly believe that equity in instruction, resources, and professional development must be the horse driving the cart of improved standards. Without equity, the new *Standards*-based tests will only further marginalize large segments of our population.

As a group concerned with professional development in mathematics, we have been particularly sensitive to the use of bureaucratic standards to "deskill" and disempower teachers. Rigidly applied standards take decision-making out of the hands of teachers (Deagan, 1998). Mathematics teachers have a special responsibility to assess critically the effects of the current standards and accountability movement. Large-scale, standardized math tests are considered authoritative gatekeepers because they are viewed erroneously as culturally neutral and objective. Those of us who support the NCTM's approach to math education must clearly differentiate promotion of the *Standards* and *Standards*-based curriculum from the use of standards to deny democratic access and equity in education.

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Deagan, D. (1998) "Math Exchange Group (MEG) sums up the year." *Literacy Update* 8,10.

have we had? We can certainly point to some successes. We have created a small but active community of math learners and teachers. We know and understand a lot more math than we did when we began. We have been able to serve as a resource for particular teachers and programs, trying to provide richer, more challenging math education. While gratifying and important successes, they are slight when judged against the larger goal of making significant change in math instruction in ABE in New York City. Our resources are meager and the task is overwhelming. We are well aware that *Standards*-based, engaging math instruction remains the rare exception.

What do ABE math teachers in New York City need? First of all, we need support for intensive professional development in math education. We need to learn mathematics and best practices: content and pedagogy. We need to connect ABE teachers to the work of the NCTM, ensure that they are capable of implementing a *Standards*-based curriculum, and that we all make use of the Council's resources. We need research to understand math education in the ABE classroom better. Recent data from the National Science Foundation studies in Ohio, Pennsylvania, and Maryland show that *Standards*-based mathematics instruction improves student achievement as it bridges the equity gap (Kahle, 2000). We need to know which practices narrow the divide between educational haves and have-nots.

We think MEG offers a model of how a small group of motivated teachers can make progress around the edges and in certain well-lighted corners. Perhaps someday all students, including ABE students, will have the opportunity to receive first-rate math educations. That is certainly MEG's goal, and in the meantime we will keep trying to be the math teachers our students need and deserve today.

> *"... we need support for intensive professional development in math education."*

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Contact MEG

Feel free to contact MEG with questions, or to join their mailing list. They can be reached at nycmeg@yahoo.com. ❖

Focus On Basics

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Seeing is Believing

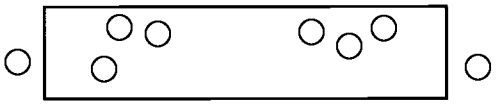
MEG has often returned to the problem of teaching signed integers and the difficulties associated with learning the multiplication of negative numbers. Students in pre-GED and GED classes are often "given" the rules for the operations of signed integers, which they dutifully try to commit to memory. However, without understanding the mathematics involved in the operations of signed numbers, this memorization feat usually fails them. In MEG's workshop, teachers conduct an investigation, visualizing and analyzing the problems of signed integers with the aid of manipulatives: two-color counters (small chips with a different color on each side).

We typically begin the investigation using the counters to model the operations of addition and subtraction of signed integers. We investigate whether a yellow (positive) chip and a red (negative) chip equal zero, using the two-color counters. We confirm that each pairing of a yellow chip (+1) and a red chip (-1) resulted in the value of 0. Thus we visualize the mathematical concept of the *additive* inverse.

+1 and -1 = 0

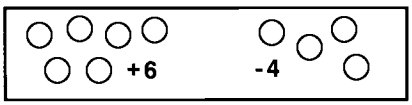
+4 and -4 = 0

It then follows that one could add and remove pairs of yellow and red chips to and from the grid — each pair representing a sum of 0 — without affecting the total value of the amount remaining.



The original value of the above was 0. If one removes a red and a yellow chip (a "0" value pair) the value remains zero.

This application of zero-sum pairs can be extended to create a visual version of any addition or subtraction problem.

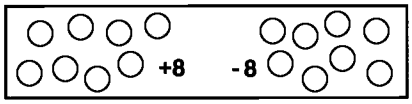


To find the value represented in the preceding box, you can remove 0-value red and yellow chip pairs until only one color remains.

+6 and -4 = +2

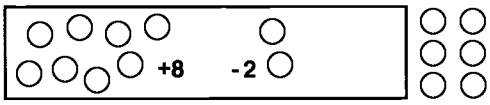
Thus, we are able to visualize the operation of addition with signed integers as we add or remove positive or negative chips.

After modeling a variety of subtraction and addition problems, we tackle multiplication. Each group in the workshop is asked to place a 0-value set of counters in front of them. For example,



+8 and -8 = 0

The groups are then asked to model multiplication of two negative integers, for instance, "- 3(-2)" by removing -2 three times.



Applying knowledge of addition and subtraction we can see why the solution is +6.

+8 and -2 = +6

which means that the original problem is

-3(-2) = +6

The idea that the multiplication of negative numbers yields a positive number can be daunting for many students, suggesting a general "irrationality" in math. "Just give me the rule," say some students out of frustration. This is all the more reason to provide students with opportunities to wrestle with the problem.

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Along with the manipulative model using two-color counters, MEG workshops also explore a variety of explanatory models. For example, we

examine the pattern created with the multiplication of negative numbers:

$$3(-2) = -6$$
$$2(-2) = -4$$
$$1(-2) = -2$$
$$0(-2) = 0$$

As we increase the multiplier by one, the product is increased by two. So, for the pattern to continue, the multiplier must become a negative number:

$$-1(-2) = 2$$
$$-2(-2) = 4$$

Another explanatory model demonstrates that multiplying two negative numbers results in a positive number because mathematical logic requires negative integers to follow the same rules as positive integers. This leads to a consideration of the distributive property:

$$a(b + c) = ab + ac$$

If we assign values a = - 2, b = 3, c = - 3 then

$$-2(3 + (-3)) = (-2)(3) + (-2)(-3)$$

where - 3 is the additive inverse of 3, so added together they equal 0.

$$-2(0) = (-6) + (6)$$
$$0 = 0$$

The explanatory power of this model derives from the logical consideration of the equation. If one does not accept that (-2)(-3) yields a positive, then it must yield a negative, which would produce the self-evidently false 0 = (-12).

****

In addition to the math content, the investigation of signed numbers is informed by the history of mathematics. Students who may be having difficulty with signed number concepts are delighted to discover that for centuries this constellation of problems has intrigued and sometimes confounded mathematicians. The Chinese reportedly used colored rods for the calculation of negative numbers as early as 500 BCE, and Brahmagupta, a 7th century CE mathematician from India, explicitly used negative numbers, as well as zero, in his algebraic work. In the 1500s, however, many European mathematicians argued against the existence of negative numbers, by stating that zero signifies nothing, and it is impossible for anything to be less than nothing (Brown, 1999). Giancarlo Cardano, an Italian mathematician of the 16th century, wrote about negative numbers and called them "false numbers." It was not until the 18th century that the mathematician Leonard Euler proved that the product of (-1)(-1) had to be either 1 or -1, and that since it was already established that (1)(-1) = -1, then (-1)(-1) = 1 (Billstein, Libeskind, & Lott,1990).

At each MEG meeting we save time for writing and reflection. Writing in journals helps teachers to integrate the basic arithmetic they are teaching with the deeper mathematical content they are learning. After the meeting on signed numbers, one teacher wrote, "To understand mathematics is to understand the beauty of its symmetry, its aesthetic, its patterns. Using manipulatives of all kinds just serves to bring one closer to that appreciation. To "get it" somehow. Not by rote but through exploration. And fun, ultimately. To engage as one would in a great story. The story of mathematics is as vibrant as the story of English. But much less often told."

Another teacher connected his experience with the two-color counter activity to his classroom practice: "Interesting modeling of + -, where +- equals 0. Will possibly intrigue students and give an explanation of positive/negatives: adding, subtracting, multiplying (I'd like to see dividing!), which could lead one to accept and absorb the rules more readily. It reminds me of knowing the concept of multiplying,(e.g., four groups of 5, arriving at 20). Many of my students do multiplying through addition. [But] there is no substitute for knowing the rules. It's great to demystify the processes, [to] give a general feel so that the rules are connected."

Some teachers who have attended MEG workshops initiate similar activities with two-color counters in their classrooms. They allow their students to develop conjectures and rules for operations with signed numbers based on students' hands-on experience and understanding of the underlying math concepts. Instead of responding to abstract and sterile injunctions to have their students memorize standard algorithms, these teachers see that their students can learn the mathematics and construct the rules simultaneously. And seeing then really is believing.

For more information on this activity, consult the NCTM's Algebra for Everyone *video (available from NCTM at (703) 620-9840 for $47.50).*

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Numeracy Needs of Adult Literacy Participants

Learners' descriptions of their numeracy needs have a surprisingly strong emotional component

by Aydin Yücesan Durgunoğlu and Banu Öney

"I want to be able to look at a price tag and know how much something costs. They think you're stupid when you have to ask."

"When I get a phone call, I tell the caller, 'Sure I'll write down your number.' You can't say you don't know. I try to memorize. But yesterday someone called my husband. I said to him, sorry I cannot remember [the caller's number] the middle letter, was it a 4 or 5 or 6? I forgot, I'm sorry."

These are quotes from women who participated in an adult literacy program in Istanbul, Turkey. Like millions of adult literacy program participants all over the world, they need basic mathematics skills to participate effectively in society. They need to interpret and process large amounts of numerical information. Although the particular mathematical skills may differ from culture to culture and from context to context, basic skills such as identifying numbers, using measurements, understanding graphs, and solving problems are high on the list of skills everyone needs to master.

Adult literacy programs are successful to the extent that they meet the needs of their participants. Recently, we completed an in-depth study of the participants in the adult literacy program with which we have been working to understand their literacy and numeracy needs as well as the impact of the program on their lives. We conducted in-depth interviews before and after participants attended the course. We will describe the evolution of the course and report the findings of the study pertaining to numeracy needs as expressed by participants in precourse interviews.

The Program

Since 1995, with the support of the Mother-Child Education Foundation, we have been developing, implementing, and evaluating the Functional Adult Literacy Program (FALP) in Turkey. FALP includes explicit instruction on letter, sound, and word recognition, as well as activities to foster reading and listening comprehension, critical thinking, and writing. It also uses practical exercises such as reading signs and bills and telling the time. Working with its 11th cohort, this program has reached about 10,000 participants in Turkey. FALP participants are predominantly female, between the ages of 15 and 65. Most report not having attended school because of economic and sociocultural difficulties, getting married young, and raising families. FALP teachers are volunteers with university or high school educations. They participate in a three-week intensive training program before they are certified to teach.

Teachers' Feedback

The very first FALP cohort had 170 participants at five different sites in Istanbul. At the end of this cohort we met with the instructors to revise the program based on their feedback. According to them, one of the most glaring omissions of the program was the lack of mathematics. Teachers stated that unless they taught some numeracy skills, they could not even ask the participants to turn to a specific page in the book. Low numeracy skills also made one of the regular classroom activities, writing the date on the board, very difficult. In addition, practical exercises such as reading bills required numeracy. The teachers recommended including instruction on recognizing and writing numerals, as well as on addition and subtraction. So, while preparing for the second and third cohorts, we added a mathematics component with topics that ranged from recognizing numerals, telephone numbers, counting, place value, and addition and subtraction, to measurement units for length, weight, and time.

Investigating Needs

After running the course for a number of years, we decided to do an indepth study of the needs of our learners and the impact of the course. The participants in the study were all living in Istanbul, a sprawling metropolis of about 12 million people. Many of them had been living in Istanbul for many years. Like many adult literacy participants, particularly newly arrived refugees and immigrants in this country, they needed some advanced skills to navigate in an urban environment. These skills are likely to be different from those needed in a rural environment. In a rural community, close neighborhood and kinship ties, intense face-to-face (rather than written) communication, more limited travel, and bartering rather than shopping at a market are often the norm. In contrast, in cities, individuals need to interact with

many strangers, for example, bus drivers, supermarket cashiers, and admissions clerks in hospitals. In addition, written information is used much more: on bus signs, telephone numbers, hospital room numbers, water and gas bills, and so on. We wanted to identify the literacy and numeracy needs as articulated by our participants living in this big city.

We asked participants open-ended questions about their life histories, educational background, aspirations, and expectations. The questions were worded to elicit information about their literacy needs in general, rather than their specific numeracy needs. However, most of the participants brought up mathematics proficiency on their own, within the context of literacy needs. We compiled the responses of 63 participants (60 female and three male) to the following two questions of the precourse interviews:

- What activities do you think you will be able to do after completing the course? Think of the activities that you cannot do right now, but hope to do at the end of the course.
- How do you think your developing literacy will affect your life?

The need for numeracy was mentioned by 39 of the 63 participants in response to these two questions. Several general themes emerged: a general need for mathematics; a need for math in some specific settings; and emotions related to participants' lack of mathematics skills.

The Functional Adult Literacy Program (FALP) has reached about 10,000 participants across three provinces in Turkey.

"Hesap-kitap"

In Turkish, the phrase "hesap-kitap" literally means "computing and bookkeeping" and it is usually used in the context of money. Seven participants said that they wanted to "be able to compute." These responses may be reflecting a narrow but very practical way of describing the numeracy skills needed for use in real life situations.

Other participants were more specific about their goals, and described nine different goals for mathematical skills. Shopping was one of the most common reasons for needing numeracy skills. One of the participants expressed this need this way: "When I go shopping, you look at a price tag, but you don't know. If you could read, you would buy it if you had enough money."

Banking was another activity for which participants needed mathematics skills. Although most participants did manage to complete bank transactions on their own, they had no way of verifying the accuracy of a transaction. One participant said: "Right now I can deposit money in a bank, but I don't know if there is any cheating." Another noted: "When I learn to read and write, I can take care of my business at the bank without asking anybody. I go to a hospital, they send me to lab, and I ask and ask, wasting a lot of time." Using the telephone, both to make calls and to write down numbers when a message is received, was mentioned quite often (see the quotation at the beginning of this article). Reading gas and water bills, working, finding a job, or being more comfortable in the workplace were also mentioned. A participant who owned a small business said: "We have our own garment shop, but I cannot prepare an invoice or stop payment on a check myself and [I have to] ask others to do it."

Going to the hospital was another theme that emerged quite frequently. Most participants told us that they had to go to hospitals with friends and relatives. Often they reported being humiliated because they could not find the offices they were sent to. "[At a hospital] they describe [where to go], for example Door 9, Dr. So-and-So. I look at the doors, but cannot see. They say, 'Do you have a problem with your eyes?' "

Problems with transportation, such as reading the signs on a bus,

were also mentioned:

"When I go to Antalya [a city in southern Turkey] to visit my sister, when the bus has a rest stop, I cannot get off the bus, even to go to the bathroom, because all buses look alike and I'm afraid of not finding my bus." [Authors' note: this is a ten-hour trip.]

Many strong emotions about the need for numeracy were expressed. These reactions can be classified into several categories: need for independence, feelings of shame, worry about being cheated, the need to help family, and jealousy. One participant provided this example: "When you go the bazaar, ask the seller [the price], and the guy says 'All illiterates find me today.' If I could read why would I ask him?"

Another mentioned the frustration of not being able to stay in contact with family: "My son is doing his military service. When I learn to read, I can call him on the phone."

Worry about being cheated or spending unnecessary funds was evident in these responses: "I can help my husband with the cash register [at his business]. You can't trust a stranger."

"A secretary would come and work at our business, answering telephones and I get upset. If I could have helped, she would not be here."

Conclusion

Adult literacy programs should focus especially on teaching skills for which their participants express a need. In our case, talking to the teachers and the learners provided us with evidence that mathematics skills were needed. Both the teachers and the participants discussed the importance of numeracy skills in literacy development. Thus, we focused on developing basic mathematics skills while presenting real-life applications that would help participants apply their skills in practical contexts.

Although we can think of numeracy in terms of dry and concrete skills, and list the contexts in which numeracy is needed and used, there was a surprisingly strong emotional component associated with the numeracy needs as expressed by our learners. The majority of the participants expressed a deep desire to master numeracy and mathematics skills at a level that would help them make sense of the world they were living in. Lacking these basic skills, they felt inadequate and helpless.

Our work focused on the needs for mathematics skills as expressed by participants of a specific adult literacy program in Turkey. However, we believe that these conclusions may be generalized to any adult literacy context in which participants never went to school and are living in a highly literate, urban context. The more the participants have an occasion to see where and how basic mathematics skills are applied, the stronger will be the impact of the adult literacy program, both cognitively and emotionally.

Acknowledgments

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Banu Öney is a senior research associate at the Education Development Center in Newton, MA. Her research interests are early literacy, adult literacy, educational technology, and staff development. ❖

NCSALL Grant Extended

In July, 2000, the Department of Education's Office of Educational Research and Improvement (OERI) elected to extend the National Center for the Study of Adult Learning and Literacy's (NCSALL's) grant for five additional years. Since NCSALL is just completing the fourth year of its initial five year grant, this new funding will support our work though the middle of 2006. *Focus on Basics* will continue as one of the primary ways in which NCSALL communicates to the practitioners and policymakers in our field.

This new funding will allow us to complete and, in some cases, continue our existing research projects. NCSALL will also begin several new research efforts. An exciting new effort will be a collaboration between university researchers and programs to establish two labsites. The labsites will provide an opportunity for NCSALL to put into practice everything it has learned as well as the findings from research undertaken by other institutions. Students in the labsites will be evaluated for several years to measure their learning gains and the impact of participation in adult basic education on several aspects of their lives. The labsites will also serve as research sites that will develop new knowledge about how to improve instruction. Portland State University in Oregon will establish a labsite focused on beginning-level English for speakers of other languages and Rutgers University in New Jersey will establish a labsite focused on adult basic education and General Educational Development students.

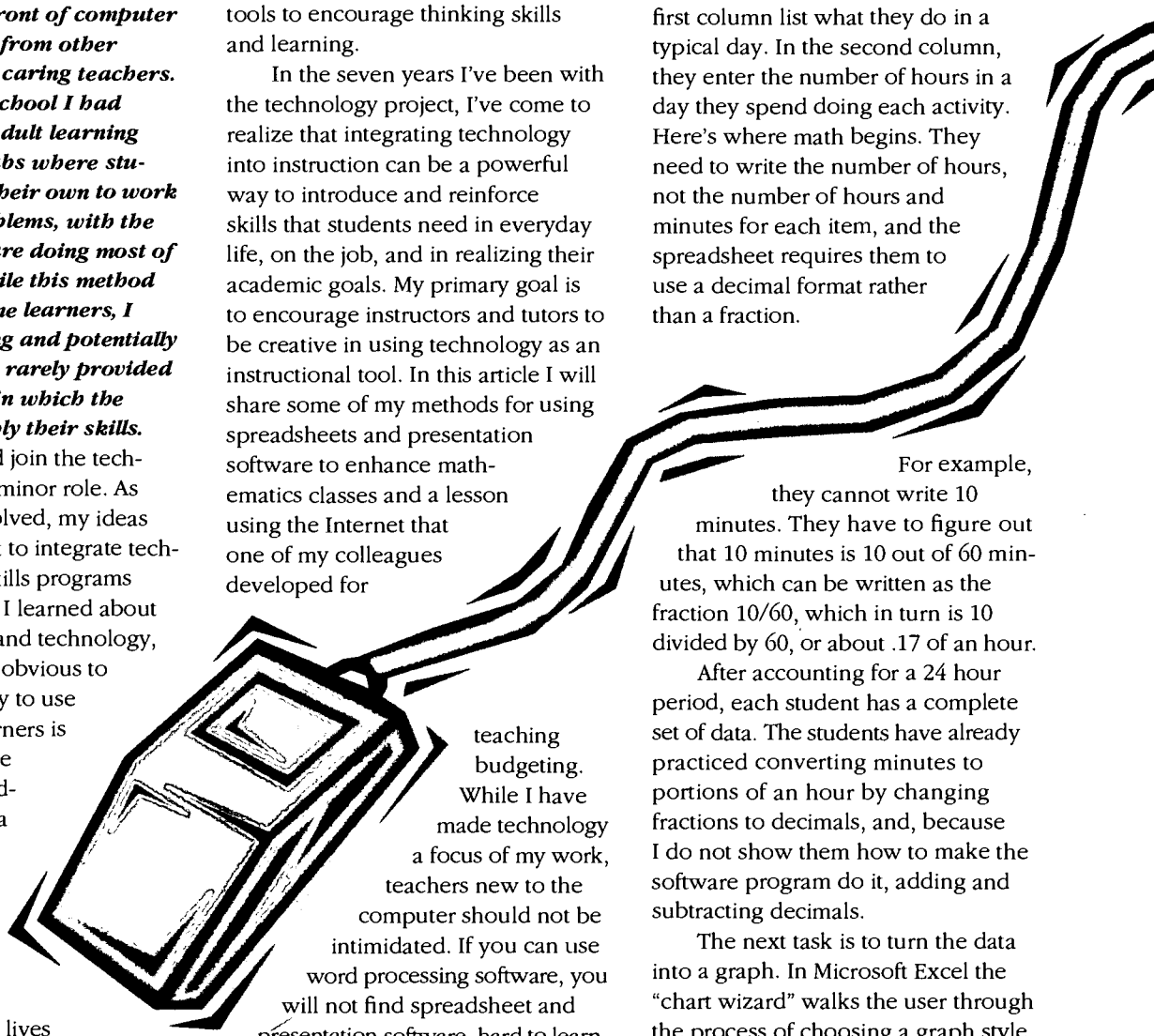
Using Software Applications to Teach Math

by Catherine Cantrell

Seven years ago I was asked to join a project that focused on increasing the use of technology in adult basic education (ABE) programs. Initially I declined. I did not believe in placing basic skills students in front of computer monitors, isolated from other learners and from caring teachers. During graduate school I had observed several adult learning center computer labs where students were left on their own to work through math problems, with the educational software doing most of the processing. While this method probably helps some learners, I found it to be boring and potentially pointless: the drills rarely provided a relevant context in which the students might apply their skills.

Eventually I did join the technology project in a minor role. As I became more involved, my ideas about what it meant to integrate technology into basic skills programs changed. The more I learned about teaching, learning, and technology, the more it became obvious to me that the best way to use computers with learners is to attend to the same concerns and considerations I would in a classroom without computers. In the classroom I encourage critical thinking skills, try to make the lessons relevant to learners' lives and goals by responding to learners' interests and needs, incorporate a variety of learning activities to accommodate strengths in learning styles, and encourage cooperative learning. So both in my teaching and in my work with the technology project, my focus became how to use computer applications, the Internet, and other technologies as effective tools to encourage thinking skills and learning.

In the seven years I've been with the technology project, I've come to realize that integrating technology into instruction can be a powerful way to introduce and reinforce skills that students need in everyday life, on the job, and in realizing their academic goals. My primary goal is to encourage instructors and tutors to be creative in using technology as an instructional tool. In this article I will share some of my methods for using spreadsheets and presentation software to enhance mathematics classes and a lesson using the Internet that one of my colleagues developed for teaching budgeting. While I have made technology a focus of my work, teachers new to the computer should not be intimidated. If you can use word processing software, you will not find spreadsheet and presentation software hard to learn. A friend or colleague can show you how to get started in a software application, and with a little practice you will be able to use it in class.



Spreadsheets and Graphs

Spreadsheets are a good way to reinforce math concepts, and I have my students use them often. I use them to introduce graphs and build on the relationship among decimals, fractions, and percentages. I start by having the class brainstorm activities people do in a typical day. As the students call them out, I write them on the white board: sleep, eat, watch TV, read, bathe, and so forth. Then I have the students open a spreadsheet (we use Microsoft Excel) and in the first column list what they do in a typical day. In the second column, they enter the number of hours in a day they spend doing each activity. Here's where math begins. They need to write the number of hours, not the number of hours and minutes for each item, and the spreadsheet requires them to use a decimal format rather than a fraction. For example, they cannot write 10 minutes. They have to figure out that 10 minutes is 10 out of 60 minutes, which can be written as the fraction 10/60, which in turn is 10 divided by 60, or about .17 of an hour.

After accounting for a 24 hour period, each student has a complete set of data. The students have already practiced converting minutes to portions of an hour by changing fractions to decimals, and, because I do not show them how to make the software program do it, adding and subtracting decimals.

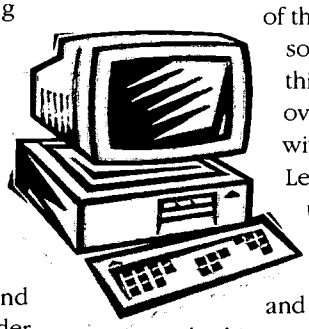
The next task is to turn the data into a graph. In Microsoft Excel the "chart wizard" walks the user through the process of choosing a graph style, adding a title, assigning labels, and choosing the legend style and placement. To show the connection among fractions, decimals, and

percentages, I instruct the learners to choose labels that display the percentage of time spent on each activity. When the learners finish, they print their graphs and answer questions such as, "What activity takes up the largest percentage of your day?" and "How much more time a day do you spend on that activity than on the activity that takes up the least amount of your day?" I also ask questions about what they found most surprising and what they might change about their day. Finally, I ask them to explain why people use graphs rather than just show the numbers in a list. These questions help them reflect on their work and its value and prepare them to understand the concepts and processes they will use later.

This lesson is a concise introduction to using computers in math class because it does not require students to have a lot of computer experience. Students use the math skills introduced in class, and they create something interesting about themselves. Each time I use it, students react positively because they readily see the value of practicing math this way. They enjoy using the computer to create something about themselves they can take home. I have also used this lesson in workshops to show teachers one way to integrate technology with teaching. I am always pleased at how many ABE and English for speakers of other languages (ESOL) teachers want to use or adapt the lesson for their own students.

Means and Formulas

After introducing spreadsheets and budgets with the time budget activity, I want the students to practice using more traditional budgets while I introduce new concepts such as finding the mean and using formulas. The second budget project I typically assign requires the students to complete a simple monthly budget for one year that includes expenses such as rent, food, transportation, and daycare. I set up in advance a spreadsheet with the expenses filled in, and their job is to write the formulas to figure the totals for each month, the average monthly amount for each item, and the annual total for each item. The newer versions of Excel include shortcuts to writing the computer commands for totals and averages. I do not teach these at first because I want the learners to understand the formulas. Before entering the commands, I have the students estimate the averages and the totals so they can tell if their commands are correct. We talk about what the elements in the commands mean as an introduction to using formulas for algebra and geometry and to give an understanding of how the computer program works.



To wrap up the budget lessons, I have the students build their own three or six month budget based on their actual (or made up, if they prefer) income and expenses. Or I give them a specific amount of money to live on for a particular amount of time and have them create a budget. One such assignment might read, "You have just accepted a six month contract for a new job. You will earn a total of $16,000 for the contract. This is your only source of income. You will get the first $4,000 at the beginning of the contract, $8,000 when the contract is two-thirds done and the last $4,000 at the completion of the contract. You need to provide your housing and living expenses during the time of the contract. Create a realistic budget to live on during those six months."

With each of these budget lessons I provide the students with an opportunity to reflect on the process they used to solve the problems, the math skills involved, and the reasons these skills might be important outside class.

Presentations

Each student creates a math lesson on a topic of his or her choice and uses software such as PowerPoint to make the presentation to the class. Presentation software works well for this assignment because it is an easy way for students to make something of which they can be proud. I begin this lesson by showing a PowerPoint presentation that explains the assignment and illustrates some of the potential of the software. I have assigned this project many times over the past few years, with great results. Learners increase their understanding of math concepts, learn about using computers, and create a professional-looking product. Even students who grumble about the assignment at the beginning frequently get so involved in making a good presentation that they later report having a deeper understanding of the concepts they are presenting.

Creating Web Pages

Lori Richardson, a teacher from Idaho who worked with me on a technology project last year, had her General Educational Development (GED) students create their own web sites to prepare for the GED tests (Richardson, 1999). Each student created a personal page for each of the five GED test areas. For the math page students could choose from two tasks. The first choice involved analyzing the theme the student chose for the entire project from a math perspective. One student who chose this assignment had organized his web site around hunting and fishing, which were family traditions. On his math page, he put information about various hunting and fishing areas, travel expenses from his home, lodging costs, and other expenses associated with hunting and fishing trips.

The second choice was to imagine having $100,000 to spend and to explain how you would spend it. A student who chose this option used the Internet to find a house in her area she would like to buy, estimated home insurance costs from another web site, picked out a used car, estimated car insurance cost, and priced a trip to Paris. She provided links to each of her references and had pictures of the house, car, and the Eiffel Tower. She even chose a hotel in Paris she could afford. She estimated that she could do all of this and still have more than $10,000 left.

Conclusion

There are many more ways technology can be used to teach math. These include setting up amortization schedules to teach percentages and compound interest, balancing checkbooks on line to learn about integers, making an evaluation chart with weighted values to teach algebra, and keeping reflective math journals using word processing software. Each of these activities takes more time than having learners use educational software or workbooks, but the outcomes are much richer. By integrating technology this way, students increase their math skills while learning the potential of the technology and developing their own computer skills.

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About the Author

Catherine Cantrell is a basic skills instructor at Shoreline Community College, Seattle, WA. She coordinates the Northwest Regional Literacy Resource Center's Technology Project, which includes working with teachers from a five-state region to increase the effective use of technology in basic skills programs. She regularly presents technology workshops at local, state, and national conferences. ❖

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Accommodating Math Students with Learning Disabilities

by Rochelle Kenyon

There may be more learning-disabled students in your math class than you realize. If you have learners who read numbers backwards, have trouble telling time, confuse part–whole relationships, have difficulty keeping score in a game, and have difficulty remembering math facts, concepts, rules, formulas, sequences, and procedures, they may be learning disabled. According to the National Adult Literacy and Learning Disabilities Center, "it is estimated that 50 percent to 80 percent of students in Adult Basic Education and literacy programs are affected by learning disabilities," (1995, p. 1). The implications of such a staggering statistic for the adult basic education (ABE) teacher are worth further investigation. In this article, we will look at some common profiles of learning disabled learners and strategies you can use in your math class to meet their specific learning needs.

A Definition

The term learning disabilities is often misused and applied to students who learn in different ways. Some people think of learning disabilities as something of short duration that can be cured with help. In fact, a learning disability is a lifelong condition that affects every aspect of one's daily activities. Although many definitions of the term exist, the Interagency Committee on Learning Disabilities' definition, as accepted by the National Adult Literacy and Learning Disabilities Center, will be used as a framework in this article.

"Learning disabilities is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities, or of social skills. These disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction. A learning disability may occur concomitantly with other handicapping conditions such as sensory impairment, mental retardation, social and emotional disturbance. It may occur along with socioenvironmental influences such as cultural differences, insufficient or inappropriate instruction, or psychogenic factors, or with attention deficit disorder, all of which may cause learning problems, but a learning disability is not the direct result of those conditions or influences." (pp. 1-2).

Dyscalculia

Dyscalculia — which is defined as a mathematics disability resulting from neurological dysfunction — can be as complex and damaging as a reading disability, which tends to be more routinely diagnosed. According to The Math Page web site, being classified with dyscalculia means having: "intellectual functioning that falls within or above the normal range and a significant discrepancy between his/her age and math skills (usually two years or more). To be diagnosed with dyscalculia, it is important to make sure that math deficits are not related to issues like inadequate instruction, cultural differences, mental retardation, physical illness, or problems with vision and hearing." It is not as commonly diagnosed as dyslexia in school because of the lack of any strict or measurable criteria.

Adults with dyscalculia experience various debilitating problems in handling daily math functions. According to Garnett (1992), the difficulty is manifested in conceptual understanding, counting sequences, written number symbol systems, the language of math, basic number facts, procedural steps of computation, application of arithmetic skills, and problem-solving. "Mathematics learning disabilities do not often occur with clarity and simplicity. Rather they can be combinations of difficulties which may include language processing problems, visual spatial confusion, memory and sequence difficulties, and or unusually high anxiety" (Bliss, 2000).

Learner Profiles

Adult education teachers need to individualize instruction for students who have learning disabilities in math. Using diverse approaches, specific emphases, and strategies and modifications that capitalize on students' strengths and minimize their weaknesses will help them to compete successfully in ABE classes. One common approach recommended by many experts in the field is the CSA sequence: from concrete, to semiconcrete, to abstract. The use of manipulatives is also encouraged. Let's take a look at two hypothetical students who are experiencing math learning disabilities and how their teachers might best facilitate their learning.

Timothy is a 28-year-old restaurant worker who dropped out of school in ninth grade. His

supervisor referred him to the Adult Center, and is providing him with incentives to improve his math skills. On the Test of Adult Basic Education (TABE), Timothy scored 8.1 in reading and 8.9 in language. In math overall, he scored only a 2.3, indicating a significant discrepancy. In the placement interview, the counselor was able to determine that Timothy "has always struggled to learn math." In math class, he experiences emotional blocks and is unable to think clearly. When his frustration level peaks, he often becomes belligerent and leaves class. In addition to high anxiety, he has difficulty mastering the basic counting sequence and math facts in the four basic operations. He also experiences difficulty in placing basic facts into long-term memory, and remembering and accessing information. He depends on the "counting all" procedure using his fingers, circles, pencil marks, or other visible reminders rather than more mature counting strategies.

Timothy's instructor might decide to capitalize on his intrinsic learning style: Is he a tactile, visual learner? She should try to try to provide a stress-free environment where learning is not tied to credits or grades. Using the CSA sequence will help him to understand math concepts and therefore alleviate some of his anxiety. After he understands the concepts, the instructor can develop some pocket-sized math fact charts that Timothy can rely on when needed. She should use intensive practice with motivational games and reading material, not forgetting that manipulatives are always useful. If he can learn to use drawing to express math, he may grasp concepts more easily. Exercises that include memory aids and thinking strategies might also be useful. Timothy's progress will be slow but steady, and his fear of math should gradually diminish.

Bernadette is 43 years old with nine children and five grandchildren. Her husband just passed away after a long illness. Bernadette dropped out of high school at 16 when she became pregnant with her first child. She has never been employed outside the home. Her husband was substantially older than she and convinced Bernadette that she was not capable of handling money. She has never paid a bill, used a checkbook or credit card, or made a transaction at a bank. According to Bernadette, "math was her least favorite subject." Bernadette was brought to the Adult Center by one of her children who is employed at the school. Bernadette had always envisioned returning to school, but life's responsibilities never allowed her the time to do so.

During her first meeting with the counselor, Bernadette admitted to having always been in a special class where she was "stupid in math." The results of the TABE revealed a discrepancy between her math and reading/language scores. Previous school records were located and confirmed a diagnosed learning disability. Her inability to do math caused lowered self-esteem, withdrawal of effort, and avoidance behaviors to anything involving numbers. She generally lacks persistence in math. She has a limited ability to estimate, cannot retain math facts, and forgets the order of procedures. She has trouble understanding mathematical concepts. She has a limited ability to solve problems in one particular way, but gets confused when the same problem is presented in several different ways. Her visual/perceptual/spatial problems make it difficult to express answers to a problem with paper and pencil.

Bernadette's math teacher can capitalize on Bernadette's strength in listening and following sequential directions. Bernadette needs to work

Common Problems of Learners with Dyscalculia

- When writing, reading, and recalling numbers, may make mistakes: number additions, substitutions, transpositions, omissions, and reversals
- Difficulty with abstract concepts of time and direction
- Inability to recall schedules and sequences of past or future events
- May be chronically early or late
- Inconsistent results in addition, subtraction, multiplication, and division
- Inability to visualize, appear absent-minded, or lost in thought
- Difficulty remembering math facts, concepts, rules, formulas, sequences, and procedures
- Inconsistent mastery of math facts
- Difficulty with left and right orientation
- Difficulty following sequential procedures and directions in math steps
- Slow in understanding math concepts in word problems
- Confuse operations signs or perform them in the wrong order
- Confuse part to whole relationships
- Difficulty keeping score during games
- Limited strategic planning ability

Source: http://www.dyscalculia.org/calc.html.

with manipulatives so she can use her tactile senses rather than depending upon reading, by breaking down problems into step-by-step sequences. She might pair her with a volunteer tutor and use math videotapes and drill and practice activities. If tutoring can take place in a private room, Bernadette can learn without interruption and without the stigma of feeling that she is being judged. Once she has developed some confidence, Bernadette may benefit from working with other students who also enjoy using manipulatives. The math problems they work on should all be designed to have meaning to Bernadette, related to functional needs such as shopping expenses, checking accounts, and recipe calculations. Bernadette may become a regular in class as she sees the relevance of math in her life and learns that she is capable of successfully handling money and other math-related household tasks.

Defining Accommodations

Accommodations is a long word to describe a different way of doing something. The term is defined by the University of Kansas in its handbook *Accommodating Adults with Disabilities in Adult Education* as "...any change to a classroom environment or task that permits a qualified individual with a disability to participate in the classroom process, to perform the essential tasks of the class, or to enjoy benefits and privileges of classroom participation equal to those enjoyed by adult learners without disabilities. An accommodation is a legally mandated change that creates an equitable opportunity for task completion or environmental access. Further, an accommodation is an individually determined adjustment to a functional need" (1998, p. 54).

They can be strategies and modifications that are used by the classroom teacher; there are also accommodations such as specialized equipment, assistive technology, and variations in the methods and materials of testing for adults with learning disabilities.

Accommodations are required by law. They help persons with disabilities to have a fair and equal chance to work, learn, and have access to physical facilities such as buildings and parks. They are based on individualized, documented needs and may include any or all of the following: (1) using special equipment, (2) changing how others think and feel about disabilities, (3) learning and working in a different place or in a different way, and (4) changing procedures. The following suggestions for accommodations were compiled from the Math Remediation and Learning Strategies web site.

Learners whose visual processing speed poses problems in classroom learning might use a note taker or a tape recorder so they can concentrate on the lesson rather than on taking notes. They might receive large print handouts including important textbook pages or take notes in different colored pens to help differentiate concepts. Trained tutors can be useful to these learners. Those who have trouble with short-term memory and auditory processing also may find useful a note taker or a tape recorder with a counter. It might help them to sit close to the teacher, or to use math videotapes to reinforce class work. Meeting with a trained tutor and tape recording important tutor explanations can also help.

Tactile learners benefit from the use of calculators, manipulatives such as blocks, Cuisinaire rods, beans, or any other hands-on materials with which they can solve problems using their hands. The scratchy surface of sandpaper, which can be cut into numbers or other shapes, provides a stimulus to tactile learners. Fluid reasoning and long-term retrieval problems can be alleviated by use of a note taker, a tape recorder with tape counter, handouts, math video tapes, fact sheets or flash cards, calculators, strategy cards, color-coded problem steps and trained tutors.

All learning-disabled students should have the benefit of accommodations in testing situations. These adjustments might include extended time; private, quiet test areas; or enlarged-type test questions. Test readers or listening to the test on audiotape can help those who have difficulty reading. Responding on the chalkboard; having the test printed on specially lined paper; color-coded math equations for those who have trouble discerning visual symbols but respond to color; using calculators; or doing the test orally are other accommodations that may be appropriate.

Conclusion

Working with learning disabled students is both rewarding and challenging. Numerous resources are available to assist you in developing instructional modifications and accommodations and finding appropriate materials and resources. Keep in mind that techniques that work well with learning disabled students can be equally effective with their nondisabled classmates.

The special needs of a student with learning disabilities make that student unique. Meeting those needs so that the student will best learn, by enhancing strengths and minimizing deficits, will increase his or her ability to learn. With some additional planning, the rewards of such accommodations will be shared by the student and the teacher.

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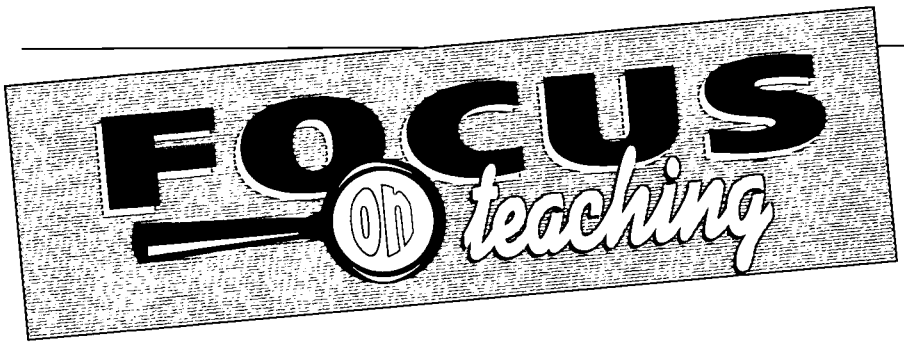
About the Author

Rochelle Kenyon received her doctorate in Educational Leadership from Florida Atlantic University. She has been in adult education for the past 29 years as a teacher, educational specialist, curriculum supervisor, and school administrator and is retired from an administrative position in the Broward County public schools. She is an adjunct professor at several South Florida universities. ❖

Teaching Strategies and Modifications for the Learning Disabled Math Student

- Avoid memory overload by assigning manageable amounts of practice work as skills are learned.
- Build retention by providing review within a day or two of the initial learning of difficult skills.
- Provide supervised practice to prevent students from practicing misconceptions and "misrules."
- Reduce interference between concepts or applications of rules and strategies by separating practice opportunities until the discriminations between them are learned.
- Make new learning meaningful by relating practice of subskills to the performance of the whole task, and by relating what the student has learned about mathematical relationships to what the student will learn next.
- Reduce processing demands by preteaching component skills of algorithms and strategies.
- Teach easier knowledge and skills before difficult ones.
- Ensure that skills to be practiced can be completed independently with high levels of success.
- Help students to visualize math problems by drawing.
- Give extra time for students to process any visual information in a picture, chart, or graph.
- Use visual and auditory examples.
- Use real-life situations that make problems functional and applicable to everyday life.
- Do math problems on graph paper to keep the numbers in line.
- Use uncluttered worksheets to avoid too much visual information.
- Use rhythm or music to help students memorize.
- Use distributive practice: plenty of practice in small doses.
- Use interactive and intensive practice with age-appropriate games as motivational materials.
- Have students track their progress; which facts they have mastered and which remain to be learned.
- Challenge critical thinking about real problems with problem-solving.
- Use manipulatives and technology such as tape recorders or calculators.

Note: *While these strategies are designed with the learning-disabled math student in mind, many of them are applicable to all learners. Source: Garnett et al, 1983.*



Beginning Math for Beginning Readers

Mathematics actually involves substantial amounts of reading. What do you do if your learners can't yet read?

This framework for a one hour math lesson for beginning readers can also be used with beginning English for speakers of other languages (ESOL) learners who have no formal education.

by Linda Huntington

In the adult basic education program in which I work, we are lucky to have teachers who have enormous expertise in teaching reading to adult beginning readers. Many of these learners have learning disabilities. An issue of concern and debate has been the question of how mathematics fits into this "reading vacuum." Does it make sense even to teach math, when students need so much direct reading instruction? And when so much of math involves reading? We have come to the conclusion that a small amount of math is beneficial even for beginning readers. Of their six hours of weekly class instruction, beginning readers in our program receive one hour of math.

I have been teaching the math class for three years. My primary objective for the beginning students is to give them work that will enable them to gain a conceptual sense of how our system of numbers works. I want them to gain accurate estimation skills and an ability to perform basic number operations in their heads, with paper and pencil, or with a calculator. I elicit from them the types of math they encounter in their daily lives and build lessons to reinforce these real-life situations. I try to present number sense activities in ways that are fun, that touch on different learning modalities, and that mirror real-life situations. I hope others working with beginning readers find my methods useful in their own classrooms.

Multilevel Beginners

This year our class includes 11 students: eight men and three women. Two of the 11 have documented learning disabilities (LD). Five of the students are from the United States, five are from the Caribbean, and one is from Ethiopia. Their ages range from late 20s to late 50s. Two of them were originally from our homeless population, and nine are employed. Their educational experiences range from completing four to 12 years of school. One student has a high school diploma. The two students with documented LD were educated in special classroom settings. Because this group of beginning readers has suspected dyslexia, direct instruction and repetition are essential class elements. Progress is measured in small steps.

Dropping out is not much of a problem. Our beginning reader students have exceptional attendance records. Three have had near-perfect attendance each year. Turnover, however, can be an issue. Over the three years that I have been teaching the class, one by one students have progressed to the next level of reading. The movement is slow but steady. As a result, some students have been in the class for more than two years and others are brand new. The difference between the new and the returning students this year is pronounced. The three new students are true beginners in both reading and math. Herein lies the biggest challenge: planning lessons that are accessible to the beginners and at the same time demanding enough for the students with more skills. It is a problem not unique to beginning classes, or to math classes. In this case, however, the issue is compounded by the fact that the students cannot read.

My methods are not earthshaking. I work hard to pair students in such a way that they can help each other. For example, if a student has strong math skills but struggles in reading, I try to partner him or her with a more competent reader whose math skills might be a bit shaky. This way each student can feel good about his or her area of strength. In addition, I always make manipulatives such as pennies, beans, or small blocks available for the students who need them when working out basic math facts. In addition, I teach all the students how to use four-function calculators as tools to help with their computation.

Strict Routine

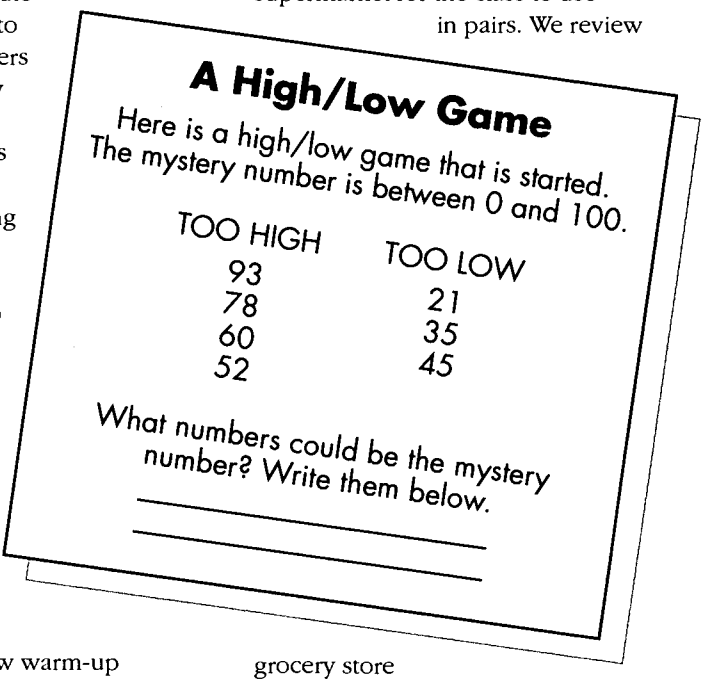
Since the time devoted to math each week is so short, a strict routine

is essential. I want the students to get the maximum out of each class. The most important reason for predictability is that it enables the students to feel more secure and in control of their learning. They know what to expect next and they are therefore less anxious about their abilities. As students begin to internalize the routine, they waste less time figuring out what to do and they learn more. Students who have learning disabilities particularly benefit from routines and consistency.

I begin each class with a warm-up activity, lasting anywhere from ten to 20 minutes. Sometimes the warm up is used for reviewing concepts. These short activities provide me a quick assessment of how "on target" each student is for that day.

One of my favorite warm ups is a game I call High/Low. I came up with this game by combining an activity called "Number Guess" from *Family Math* (Stenmark, Thompson, & Cossey, 1986, p. 29), with a game I used to play with my daughter, Laura, during family trips when she was in elementary school. The game is a simple number-guessing game: students try to guess a "mystery number" and are given clues as to whether their guesses are too high or too low. We set limits beforehand as to how high the mystery number can be. This activity gives me insight into whether or not the students can count and understand number patterns. Students who win get to pick the next number. My students really enjoy this level of competition. They love to win, but they also help each other when someone is stuck. Winning means you must give the clues to the class, and giving the too-high or too-low clues can be a challenge for many students.

High/low just keeps evolving. I have developed simple worksheets for class or for homework that go with the game (see the sample on this page). Recently I added a new twist: When only a few numbers are left — for example, when 50 is too high and 42 is too low — I stop the guessing for a minute and ask everyone to write all the numbers that could possibly be the mystery number. This helps to focus them on the idea of counting between two specific numbers. Then I ask them to circle the number they think is the right number and we go back to guessing until the correct number is finally picked.



A High/Low Game

Here is a high/low game that is started.
The mystery number is between 0 and 100.

TOO HIGH	TOO LOW
93	21
78	35
60	45
52	

What numbers could be the mystery number? Write them below.

_____

_____

Quick Drill

I usually follow warm-up activities with some kind of quick drill. This part of the lesson varies in format and can include a short worksheet, calculator practice, a round robin or skip counting practice, drawing number patterns on a hundreds chart, flash card rotations, bingo games, following directions, or other games involving number facts. On occasion, the class drill involves math vocabulary and spelling practice. Two of the class's favorite games, "Target Addition" and "The Sum What Dice Game," come directly from the book *Family Math* (pp. 32, 37). Some of the students have memorized the basic number facts (addition and subtraction families up to 10 + 10, multiplication tables up to 10 x 10); others have not, and may never. Nonetheless, a certain amount of rote drill helps to trigger the students' memories.

The third component of every class is the main lesson. I rely on real-life materials whenever possible. Much of our problem solving involves what can be loosely termed household or consumer math. For example, I bring in enough flyers from the supermarket for the class to use in pairs. We review grocery store vocabulary. They discuss the words used when buying certain products: pound, roll, pack, tub, box, bag, can, jar. Everyone writes these words on their paper while I write them on the board. These might show up later in a bingo game. Next they work, usually in the same pairs, on a worksheet that asks them to find the price of a specific item. They might be trying to spend a given amount of money or no more than a given amount. They might have a grocery list with products to find; then they figure the total bill. Maybe they have won a $500 shopping spree. The possibilities for math are great. I sometimes ask them to calculate the correct change, sometimes I bring in coupons to use, or I might ask them to write their own questions using the information on the flyer. The key point is not to ask too much in any one class, and to repeat the exercise, with small changes, over several weeks. See the next page for an example of one such supermarket worksheet that goes with a supermarket flyer.

Many of the math classes with beginning readers do not strictly follow this three-part model. Occasionally we get sidetracked and take a longer time with the warm-up or on drill. In the end, some classes may include only parts one and three; others, only one and two, or two and three. All this must be accomplished without relying on reading.

STAR MARKET
Super Shopping

Some Vocabulary

lb.	frozen	supreme
oz.	ct.	pint
liter	light	gallon
pkg.	regular	ea.

Some Questions

1. You buy 2 lbs. of grapes.
   You pay _____
2. You buy 3 2-liter bottles of Pepsi.
   You pay _____
3. You buy 5 mangoes.
   You pay _____
4. You buy 1 box of CHEEZ-ITs.
   You pay _____
5. What is the TOTAL?
   _____

You have won a shopping spree of $10. What could you buy? List the items below.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

How much did you spend? _____
How close did you come to $10?

Talking about Numbers

Instead, we do lots of talking about numbers. For example, before beginning a unit on shopping, we discuss the techniques the students have for checking their change or for getting the best buy. We might share ideas about using coupons or where to shop. I want to give the students enough self-confidence so that they never need to feel scared of numbers or math. In fact, they already have developed sound number sense through living their daily lives: from shopping, working, traveling, raising their children, and managing their time. Our math class is designed so that the students gain awareness of the math skills they already possess and learn how best to use them.

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About the Author

Linda Huntington has been teaching math at the Community Learning Center in Cambridge, MA, for more than 12 years. She has taught mathematics at many levels including beginning adult basic education, English for speakers of other languages, General Educational Development test preparation, and post high school.❖

Focus on Basics Electronic Discussion List

Focus on Basics electronic discussion list is a forum for discussion about the articles published in *Focus on Basics.* It is a place to converse with colleagues about the themes examined in the publication; to get questions answered and to pose them; to critique issues raised in the publication; and to share relevant experiences and resources.

To participate in the *Focus on Basics* discussion list (it's free!), go to the LINCS homepage at http://nifl.gov. Choose "Discussions." Scroll down to and click on "*Focus on Basics.*" Then click on "Subscribe," which is to the left, and follow the instructions. Or, send an e-mail message to LISTPROC@LITERACY.NIFL.GOV with the following request in the body of the message: SUBSCRIBE NIFL–FOBasics firstname lastname
Spell your first and last names exactly as you would like them to appear. For example, Sue Smith would type: subscribe NIFL–FOBasics Sue Smith

There should be no other text in the message. Give it a couple of minutes to respond. You should receive a return mail message welcoming you to NIFL–FOBasics.

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Resources on Mathematics Instruction

- National Council of Teachers of Mathematics, (2000) *Principles and Standards for School Mathematics.* Reston, VA: National Council of Teachers of Mathematics. For information on purchasing the publication in book, CD-ROM, or Portable Document Format, please visit www.nctm.org/standards/ or call toll-free (800) 235-7566.

- For information on the Mathematics Test of the GED 2002, contact Kenn Pendleton of the GED Testing Service, American Council on Education, One Dupont Circle NW, Suite 250, Washington, DC 20036-1163; telephone (202) 939-9498; fax (202) 775-8578; e-mail kenn_pendleton@ace.nche.edu; or visit the web site http://www.acenet.edu.

- A new book, *Adult Numeracy Development: Theory, Research, Practice,* is available from Hampton Press. Edited by Iddo Gal, it contains 16 chapters written by adult educators and researchers. Chapters include "Numeracy and Adult Learning: Implications of Research for Instruction;" "Understanding NCTM Standards;" "Instructional Principles for Adult Numeracy Education;" and "Teaching Mathematics to Adults with Specific Learning Difficulties." Orders can be placed with the publisher, phone (800)-894-8955, via e-mail: HamptonPRI@AOL.com, or via online sellers such as Amazon.com.

- Adult Learning Maths (ALM) is an international research forum that brings together researchers and practitioners in adult mathematics and numeracy to promote the learning of mathematics by adults. To join or to learn more, contact Dr. Katherine Safford, Saint Peter's College, Kennedy Boulevard, Jersey City, NJ 07306, or e-mail her at safford_k@spvxa.spc.edu. ALM's web site is at http://www.euronet.n./~agroenest/alm.

- ANAMOL: Adult Numeracy And Mathematics On-Line is a project that attempted to link adult numeracy teachers from across Australia together via the Internet. Visit its web site: http://sunsite.anu.edu.au/language-australia/numeracy/anamol.

- Adult Numeracy Network is a community dedicated to quality mathematics instruction at the adult level. For more information, visit the AN2 web site at: http://www.std.com/anpn.

- The Numeracy E-Mail List is an electronic discussion list for ideas and discussion on the teaching of numeracy and basic mathematics to adult learners. To subscribe, write to: majordomo@world.std.com. In the message area, type: subscribe numeracy.

- *Family Math,* by J. Stenmark, V. Thompson, & R. Cossey, is available from Lawrence Hall of Science, University of California, Berkeley, CA 94720. Call (800) 897-5036, or go to the web site http://www.lhs.berkeley.edu/EQUALS/

The Labor Market and the GED

- *Beyond the GED: Making Conscious Choices About the GED and Your Future,* a set of teaching materials for GED teachers, is now available from NCSALL. Written by GED teacher Sara Fass and *Focus on Basics* editor Barbara Garner, and piloted by Sara in her class, the materials consist of three units: "The Labor Market," "Pursuing Higher Education," and "What the Research Tells Us." Lesson plans, reading materials, and handouts are provided. To order, send a request with a check for $5 to cover the cost of photocopying and mailing to Sam Gordenstein, World Education, 44 Farnsworth Street, Boston, MA 02210-1211. Please include contact information such as phone number or e-mail address.

NCSALL Reports Available

- New research reports are available from NCSALL. Order by sending a list of the reports you want (by number) and a check or money order for the correct amount to Sam Gordenstein, World Education, 44 Farnsworth Street, Boston, MA 02210-1211. Please include contact information such as phone number or e-mail address. The charges cover photocopying and mailing. The reports can also be ordered over the web, http://gseweb.harvard.edu/~ncsall.

Reports #13: Bingman, B. & Ebert, O. (2000). *"I've Come A Long*

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continued from previous page . . .

Way:" Learner-Identified Outcomes of Participation in Adult Literacy Programs. $10

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Karen Backlund with Kathy Bond
(Volume 1, Issue A, February 1997)

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Teaching to the Math Standards with Adult Learners
Esther D. Leonelli
(Volume 3, Issue C, September 1999)

The Effects of Continuing Goal-Setting on Persistence in a Math Classroom
Pam Meader
(Volume 4, Issue A, March 2000)

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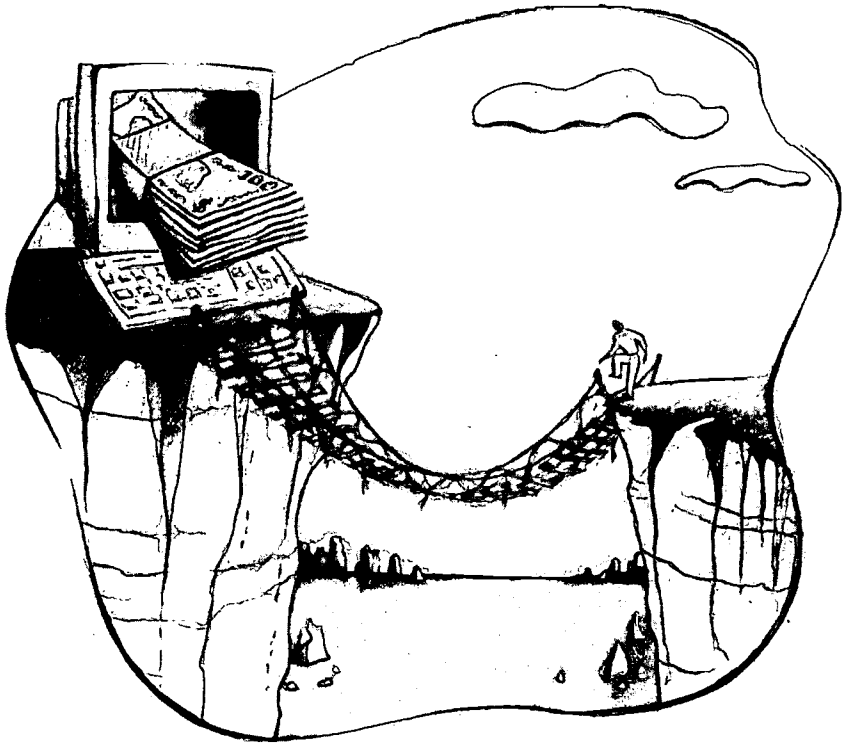

Across the Great Divide

Can family literacy programs prepare families for a technology-driven society? The potential is there.

by Jeri Levesque

Family literacy programs strive to promote school success in children and economic self- sufficiency in parents by integrating intergenerational literacy activities with parents' life-centered demands. How do family literacy projects integrate educational technologies and prepare families for success in a society increasingly dependent upon, even driven by, technology?

I explored this question as a statewide evaluation consultant for a midwestern state's Even Start family literacy programs. Over the course of one year, I visited nine program sites to observe and interview family literacy staff. I also taught five Internet and three distance-learning workshops for practitioners, e-mailed an Internet technology survey to 12 project directors (only four of

Continued on page 3

Focus on Basics is the quarterly publication of the National Center for the Study of Adult Learning and Literacy. It presents best practices, current research on adult learning and literacy, and how research is used by adult basic education teachers, counselors, program administrators, and policymakers. *Focus on Basics* is dedicated to connecting research with practice, to connecting teachers with research and researchers with the reality of the classroom, and by doing so, making adult basic education research more relevant to the field.

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WORLD EDUCATION

Welcome to *Focus on Basics*

Dear Readers,

In this issue, we look at how a number of adult basic education (ABE) programs are using technology. Certain themes emerge. In contrast to the stereotype of computers creating fixated social misfits, programs that include computers in their instruction find that users build community as they help each other navigate the hard- and software. Technology also allows learners to be teachers, sharing their proficiencies both with other learners and with the teacher. And, access to the World Wide Web can expand learners' worlds.

Of course, not all programs are using technology successfully. In our cover article, Jeri Levesque writes about the obstacles ABE programs must navigate in incorporating technology. Jennifer G. Cromley, in the article that starts on page 6, examines the research literature on computer-assisted instruction, providing tips on how to ensure that computer use enhances learning. In a conversation with Ron Stammen, page 28, we're reminded that teachers need on-going support as they attempt to bring technology into the classroom.

Providing instruction in computer use helped one Vermont program attract and retain learners, explain Ralph Silva and Walter Wallace in their article on page 12. On page 14, Steve Quann and Diana Satin write about how their learners also enjoyed computer instruction, particularly when given opportunities to practice English as they learned to navigate the technology.

Calculators are another form of technology. G. Andrew Page shares with us on page 19 his strategies for introducing calculator use in an ABE program. Maura Donnelly struggled with her class's embrace of a more complicated technology: building a web site. Turn to page 20 to read about what her class did, then visit their web site at http://hub1.worlded.org/docs/gb/default.htm.

Now that you're on the Web, how will you choose a site to use with your class? Emily Hacker provides some suggestions in an article beginning on page 25. In East Texas, incorporating a computer lab into the program's main site and using lap tops to take technology to remote classrooms meant that volunteers and learners could start their ABE activities immediately, as reported by Kelley Snowden on page 29.

Thanks to Janet Smith of the National Center on Adult Literacy for creating what we hope will become a handy, computer-side reference: an overview of technology-based projects and resources for ABE that starts on page 33.

While many adult basic education institutions and teachers have embraced technology as an integral part of their programs, many still lag behind. Whether cost, space, capacity, or philosophy is the barrier, programs that fail to provide their learners with at least an introduction to technology are doing them a disservice. We hope that this issue of *Focus on Basics* serves as a nudge in the right direction by encouraging programs to enable their learners to span the digital divide.

Sincerely,

Barbara Garner

Barbara Garner
Editor

Digital Divide ... *continued from page 1*

whom responded), and reviewed local programs' annual evaluation reports.

During my site visits I never once observed an adult learner using the Internet. Few computers were wired to the Internet, since much of the equipment I saw was from the Apple IIe era. I frequently observed adults practicing keyboard skills such as typing, making personal greeting cards using the Print Shop™ program, and practicing basic study skills using a software program. These observations are in line with a recent federal report (NTIA, 1999a), which concluded that there is a gap between those who have access to new technologies and those who do not. My observations confirm the NTIA conclusion that adults with less education, especially low-income parents in family literacy programs, who could perhaps benefit most from the Internet's educational value, are being left behind in terms of their skills and familiarity with technology.

The Reality

The nine program directors I visited identified use of computers and the Internet as a strong interest of many parents in their programs. For example, one adult educator reported that women in her program significantly increased their attendance when they were given e-mail addresses and daily access to the Internet. However, she later abolished Internet access when she discovered that all of the women were signing into chat rooms to find men to date. Three women dropped out of the program when their computer access was eliminated. Conversely, another director stated that she encouraged her learners' use of e-mail pen pals, journal writing, parenting research, and writing development on the computers. She reported higher retention and attention rates as a direct consequence of her center's increased access to educational technology.

I toured each program's computer lab to determine how adult learners use technology on a daily basis. Every site had a battery of computers reserved for the PLATO software program, which provides practice exercises and computer-assisted preparation for taking the tests of General Educational Development (GED). It was often loaded on the newest and most powerful desktop computers. However, a licensing agreement between the software manufacturer and the division of Adult Basic Education forbade any access to the Internet or use of other software on these computers. How will these adults learn to use the Internet if access is forbidden in a publicly funded educational program?

Most of the nine programs reported some degree of technical support for their computer systems, especially in-service training, from their local school districts. The existence of computers does not, however, mean that they are used. The gap between practitioners willing to integrate technology into their teaching and those who shun computers still exists. One program director expressed regret for not "pushing" her staff enough and making them comfortable with computers or adequately preparing them to meet adult learners' increasing technology needs. Three program directors from well-established family literacy programs credited the lack of computer instructional creativity and usage to their adult educators' limited formal training in teaching methodologies, minimal computer literacy, and a high degree of reluctance to use the Internet in any capacity.

The program directors were consistent in their view that regardless of age or literacy abilities, many parents perceive computer literacy as a key skill for getting "good jobs" and ensuring their children's school success. Parents appear to understand that their children need computers to access information, do homework, and develop job skills. Many parents believe that their families' economic plight further disadvantages their children in school because they could not afford a home computer or Internet access. This is the "Matthew Effect" (Stanovich, 1986): the technologically rich get richer, and the technologically poor get poorer. The two cases that follow are examples of this phenomenon.

Recycled Technology

One rural site I visited was based in a renovated home with two bedrooms designated as computer labs. All of the computers were donated by local businesses. The first lab housed three long worktables holding a conglomerate of hardware. There were two color monitors among the older amber- or green-on-black screens. Most computers were in need of serious repair. Each computer was dedicated to a particular learning software package and only one was connected to a printer. The only computer connected to the Internet was in the teacher's office. When asked about his views on the educational applications of the Internet, he replied that he did not see any particular usefulness of "cyberspace" for teaching adults or passing the GED.

This program's second computer lab was reserved for post-GED adult education students who continued to receive support while writing term papers for their courses at the local community college. This lab had a dot matrix printer and older desk jet printer connected to four computers. On the middle table sat three lap top computers. The screens of two laptops were propped up with sand-filled coffee cans. Surely, I thought, this is the far side of the digital divide.

This case may seem extreme,

yet I found similar attitudes and arrangements in suburban, urban, and other rural sites. Much of the technology used in the programs was acquired secondhand from local schools and businesses. Of most concern, however, was the lack of any reference to computer-assisted instruction or the Internet in seven of the 12 evaluation reports I reviewed. The scenario seemed odd to me, since I have had a technologically enriched K-12 and university teaching background, yet it was familiar to many family literacy practitioners.

Navigating Obstacles

I visited a rural family literacy program in its fourth year of operation. The program director, a strong advocate of educational technology, included a computer lab in her first funding proposal and her staff regularly attended in-service computer sessions. She cited two barriers to fully integrating technology with her family literacy program components. The first was the refusal of her adult basic education instructor to use computer-aided instruction software or allow her students to use a word processor to prepare for the GED. The teacher's position remained steadfast, despite attending annual computer and educational technology workshops sponsored by the state's literacy resource center. The site director responded to this problem by recruiting two volunteer faculty members and one student volunteer from a nearby university to work with parents outside of the GED class. She also shifted the adult learners' use of computers and the Internet to the parenting component of the program, which was taught by other staff and supported by the volunteers.

The parenting component of family literacy programs helps adult learners to explore important subjects related to parenting and family life. This center's philosophy supported Internet technology as a means for parents to address many topics while also identifying and solving problems associated with parenting and life skills. To achieve this goal, all staff and interested adults at this center were provided with free e-mail accounts. Several staff members attended training sessions in web site design and development, and helped set up a web site for the program. The staff and parents worked together to update the web site quarterly.

"Many parents believe that their families' economic plight further disadvantages their children in school because they could not afford a home computer or Internet access."

Parents routinely researched parenting concerns, ranging from diagnosing and treating children's earaches to local employment opportunities. They regularly used search engines to locate information, write reports about their research, and then present their findings during weekly sessions of Parenting Time. Creative writing assignments became so popular that the program purchased a scanner for parents to use to illustrate books and add to family portfolios.

The second challenge was a directive by the Department of Health, Bureau of Licensure, which, in accordance with child safety policies, forced the removal of the computers from the infant/toddler rooms. Center-based family literacy programs encourage parents and their children to play in the preschool classroom, where everyone is comfortable with the setting, daily routines, and rules of behavior. The computers were previously used in this room during Parent and Child Together (PACT) time. The PACT component of a family literacy program is designed to provide parents with strategies to support children's learning in the home. During PACT time parents and their toddlers and preschool children played with interactive software games and other family-oriented learning activities. The director also noted that the colorful and animated screen savers provided babies with visual stimulation. Some parents were upset with the notion that the "authorities" declared the computers to be a "bad thing for little children."

The program had also been donated a variety of recycled computers and software including old Apple IIe computers with Title I software on floppy disks. These reading readiness programs were loaned to the parents for home use. Parents received additional coaching on the computer during regular home visits by staff. After four years, only one of these computers was lost or destroyed. The one in question succumbed to insect infestation, not a computer virus.

The computer home loan program, although highly valued by parents, also revealed a serious, unforeseen problem. All of the parents wanted to borrow the computers. Typically, parents became excited by the possibility of owning a home computer and wanted to go out and buy one. Several families became involved in scams concocted by disreputable firms that sold poor-quality equipment with overpriced financing schemes. However, observed the director, this financial horror led to group lessons on

financing during parenting group sessions. Later, and as a direct result of this experience, two single parents set and attained goals that included getting jobs and buying home computers.

Spanning the Gap

If the nation expects to address its citizens' literacy challenges, funders must make family literacy programs' access to high-quality technology resources and appropriate professional development activities for program staff a high priority (National Literacy Summit, 2000). The digital divide — the gap between those who have access to new technologies and those who do not — is a significant civil rights, economics, and educational issue (NTIA, 1999a). The demographics of the technologically underserved population bears a strong resemblance to at-risk adults and their children served by family literacy programs. These adults are especially affected when they arrive at job interviews without computer skills. The problem also affects their children, who engage in schooling without the support of Internet information and word-processing capabilities. The divide is only increasing (NTIA, 1999a).

I observed digital learning environments that connected families with meaningful information and the motivation to learn how to become skilled readers. This motivation raised issues regarding appropriate use of an Internet service that is paid for by a literacy program but may be covertly accessed to advance an adult learner's personal agenda for learning. In two of the programs I visited, adult learners were encouraged to join their local libraries, which provided free Internet access. Recently, the state Adult Education and Literacy (AEL) division expanded its capacity for educational technology by contracting with an Internet-based study skills bank and providing each literacy site with more computers. One program director wrote a grant to have the library provide Internet search training and other technical assistance to her program's participants. According to The Children's Partnership (1999), much online content is designed for users with discretionary money to spend, and many Internet sites are written at reading levels too high for basic education learners. However, the desire to locate and understand information of choice is a powerful motivation. Whether an adult learner is motivated by a desktop publishing project involving family stories and personal greeting cards, or by practicing for a standardized achievement test, family literacy programs should and, with creativity, can match these personal learning goals with appropriate educational technology.

Family literacy programs use technology well when they use it to address learners' learning goals and interests. Family literacy practitioners and tutors need paid professional development opportunities in which to explore new instructional concepts about Internet learning, distance learning, and to develop creative methods of computer-assisted instruction. These staff development sessions should infuse technology with PACT, early childhood, adult and parenting content.

> *"The technologically rich get richer, and the technologically poor get poorer."*

Family literacy practitioners understand that the education of children and their parents is interconnected. Connecting literacy learning with technology is a powerful means of breaking the intergenerational cycle of low educational levels and poverty. Family literacy programs have the programmatic structure to integrate educational technologies with play activities shared by parents and their preschool children. While many of the programs I evaluated are not yet doing so, they can help adults to use technology to achieve personal learning goals, develop communication skills, accommodate individual learning styles and disabilities, enhance self-esteem, and increase employability skills. Closing the digital divide is essential for age-appropriate educational success and economic self-sufficiency.

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Learning with Computers: The Theory Behind the Practice

by Jennifer G. Cromley

Adult basic education (ABE) teachers are excited about the potential that technology offers for improving students' learning and expanding students' worlds. While computers in particular hold much promise, we must understand how they can and cannot help students, and what they are and are not currently capable of doing. Why does some computer-assisted instruction improve students' learning, while other does not? What does research tell us about the most effective ways of using technology in instruction? Researchers who have looked at the use of commercially available software in classrooms have not found marked differences between how learning happens when a computer is used and when it is not.[1] Instead, effective use of technology reinforces several learning principles already used in successful ABE instruction.[2]

Most research on the use of technology for learning has looked for features that make it more effective and efficient than instruction that does not incorporate technology. In this article, I will explore these features, and address some reasons why educational software designed for ABE often fails to incorporate these features. Then I will examine the implications of our knowledge about computer-assisted instruction for ABE teachers.

Some Limitations

Research on computers in education is several years behind actual computer use. Other than case studies, most research on using computers in instruction has been done with school children and has tested commercial software packages. Much software has been developed by computer programmers and to some extent by educational technologists (Meyer & Rose, 1999) not familiar with adult learning theory (Askov, 1998). Many researchers, therefore, consider that most of the potential of computers for learning has not been tapped (Mandanach & Kline, 2000).

Most computer use in K-12 classrooms focuses on two applications: drill-and-practice software and computer programming (Cognition and Technology Group at Vanderbilt [CTGV], 1996). Other software showcases the newest "bells and whistles" that computer software has to offer, but it is technology-, not learning-driven (Jonassen & Land, 2000). In fact, most educational software is based on behaviorism: the idea that people learn when they are simply exposed to information and are rewarded for choosing right answers.[3]

Despite a high level of interest in technology among teachers and policymakers in ABE, little published research on adult literacy students and technology exists.[4] Beyond individual teachers' recommendations and experiences, adult basic educators have little firm evidence for the most effective ways to use technology in the ABE setting. Until we have a body of research on adult literacy and technology, we can benefit from the lessons learned from computers used with K-12 and college-aged students. The review of the literature that follows here is therefore very selective. In some cases, only a few studies back up the suggestions; in other cases, dozens do, and I have cited only the most pertinent.

Effective Uses

When researchers have compared more and less effective uses of technology, they have noticed that computer use that involves one or more of the following appears to be most successful:

- Critical thinking skills
- Customization and student interests
- Human interaction
- Student collaboration
- Accommodating disabilities
- Using drill for memorization
- Performing real-life tasks
- Performing complex tasks

Technology can tap different skills than do textbooks and group work. For example, ABE learners need to develop complex thinking skills. They need to be able to analyze and read critically, to explain what they believe and why they believe it. ABE students might feel nervous when asked "why" in front of a class. Computer software can prompt learners to explain their thinking without making them feel vulnerable. The *Scientists in Action* software series asks learners to choose a tool for measuring mussels, crayfish, and other macroinvertebrates that are sensitive to river quality, and are therefore an indicator of pollution.

> *"Research on computers in education is several years behind actual computer use."*

Students choose a tool and also give an explanation for why they chose the tool. They receive feedback over the World Wide Web from students in other classrooms (Vye et al., 1998). Students examine their thinking processes by engaging in these dialogues. Several good software packages such as this exist, and I believe they would appeal to adult learners.

Another skill many ABE learners must develop is the ability to compare and evaluate information. The seemingly endless sources of information on the Internet almost dictate that Internet users do this (Benton Foundation, 1997). In addition, the Internet provides teachers with an easy way to find texts with opposing viewpoints that can generate student discussion and debate. ABE teachers can use computers to develop evaluation skills by downloading materials from the Internet to use in conventional classes or by asking students to search for information and then evaluate the credibility of the sources. For more on this, see page 25.

Increased Interest

Many adult education teachers have seen a student's engagement increase when they wrote word problems based on a student's favorite sport or hobby. Perhaps they created games that allow students to practice skills in an engaging way. They may have used the language experience approach, in which a student dictates a story to the teacher, who writes it down so the student can then read it. Studies of children have found that computer programs are more motivating when they included the user's name and interests in the problems (Cordova & Lepper, 1996) and used game formats (Fitzgerald & Koury, 1996). In one of these studies, for example, a math game gave students feedback such as "Congratulations, Bill, you just saved New York from the aliens." Few commercially available software packages, especially software designed for ABE use, incorporate these motivational features. ABE teachers should seek out software that does.

"... students rewrite more often when they use word processors because they do not have to tediously recopy everything they have written."

Spreadsheets, calculator software, word processing programs, and some math programs can relieve students of tedious calculating and copying, freeing them to focus on understanding concepts (see the article on page 19 for more on the role of calculators in teaching mathematics). Many elementary school students have used the Logo computer programming language for math activities. Using Logo, students have to program the computer, for example, to draw and copy angles; the computer does the calculations for them. A review of 10 studies in which middle-school students used Logo to learn measurement, fractions, and geometry showed better learning for students using the computer than for students in traditional classrooms (McCoy, 1996). Students can use computers to perform many real-world math tasks, similar to the way spreadsheets are used in the workplace (Merrill et al., 1996).

Likewise, students rewrite more often when they use word processors because they do not have to tediously recopy everything they have written (Kamil et al., 2000).

Interactivity

Studies of both traditional pencil-and-paper methods and distance learning, such as web-based courses and two-way video courses, show that student–teacher and student–student interaction are vital to keeping students from dropping out and enabling them to learn effectively (Hiltz, 1999; Parke & Tracy-Mumford, 2000). Parke and Tracy-Mumford found that distance learning programs in which students studied on their own and rarely interacted with others led to little learning and showed high student dropout rates. Computers are most effective in distance education classrooms when they are used in ways that include person-to-person interaction. Interactive methods include real-time chat rooms (in which users can post messages that are read right away, like a typed conversation), electronic discussion lists and bulletin boards (in which e-mail is posted and distributed to all users, sometimes at a later time), threaded discussion lists (electronic discussion lists where messages are sorted according to topic), telephone conferencing, and face-to-face meetings. Building human interaction into distance learning may be more effective than noninteractive distance learning in prompting learning, because teachers and fellow students ask questions that require high-level thinking skills.

Game-type interaction, where the computer flashes a smiling face or a score or tells the student an answer was correct, is not enough to keep distance learning students engaged. Although much educational software

is called interactive, most of it does not truly "interact" with the student: it just tells the student whether she or he answered the question correctly. This helps students to memorize facts but does not build deep understanding or critical thinking skills (Report to the President, 1997). Only the most sophisticated artificial intelligence programs developed by universities can give constructive feedback similar to the interaction between a human teacher and a student. At this time, these programs are not available commercially.

Teachers in ABE programs can build in interaction when using computers by having discussions before and after students use computers, just as teachers have discussions before and after students read from a book. To be effective, distance education in ABE should always incorporate student–teacher and student–student interaction.

Collaboration

Many ABE teachers find that students learn better when they work in groups to solve a problem. Project-based learning (working together on real-life class projects), jigsaws (splitting students into "expert" groups who report back to each other), and other cooperative learning methods help students to solve more difficult problems than they could on their own, learn from each other, and build critical teamwork skills. Educational computing researchers are designing applications that allow students to work collaboratively by linking many classrooms or many students in a classroom. These projects have resulted in increased student learning and motivation (CTGV, 1996). In the Computer-Supported Intentional Learning Environment (CSILE) project, for example, high school students used computers to contribute to a classwide database by writing and drawing about topics they were studying, including social studies, science, literature, and math. Students who used the computers collaboratively showed better results on tests of deep understanding of the topic, using what they had learned in a new situation, learning more for understanding (rather than just to pass a test), and also scored higher on standardized tests (Scardamalia et al., 1994). These findings on the benefits of collaboration parallel findings about students working in groups in conventional classrooms (Slavin, 1998).

"...most of it does not truly 'interact' with the student: it just tells the student whether she or he answered the question correctly."

ABE teachers can have students engage in e-mail discussions with an outside "expert" such as another teacher or another ABE classroom. Several good collaborative software packages exist, such as CSILE and LabNet, which I believe would appeal to adult learners. See the article on page 33.

Accommodations

In many K-12 schools, students who have learning disabilities use specialized technology to support their learning. Text-reading software and hardware (as well as books on tape) are used to read books to students with visual disabilities and learning disabilities. Text-reading technology helps students to learn new content (Merrill et al., 1996), but technology alone does not help them learn to read better since they are not practicing reading (Fitzgerald & Koury, 1996). Having students read along while listening to books on tape is highly recommended for those with reading difficulties (McCormick, 1999). Although little research has been done with adult literacy students in this area, one small study showed that Army recruits who read along with an audiotape comprehended a reading better than those who read alone or who listened to the audiotape alone (Sticht, 1969). A more recent study with college students with severe learning disabilities found the same benefits, but found that reading technology actually interfered with the learning of college students who had milder disabilities (Raskind, 2000). Overall, it is not clear whether reading machines help students with or without disabilities learn to read, which is a necessary skill for becoming an independent learner (Meyer & Rose, 1999).

Speech-recognition software is used to help students with physical and visual disabilities and learning disabilities to learn to write. The ability to revise quickly using word processing programs, combined with spell-checking features, has been found to improve all students' writing (Kamil & Lane, 1998). In a review of four studies with learning-disabled college students, word processing with spell checking provided similar benefits (Raskind, 1998). One of these studies also found benefits from speech production software that read drafts aloud to college students with learning disabilities. The evidence for the use of word processors to improve writing with adult literacy students is therefore stronger than the evidence supporting text-reading

machines, but it is not definitive.

Audiotapes have been used extensively in classes of English for speakers of other languages (ESOL) and in language labs. While this technology can help learners build pronunciation and listening skills, language learning has shifted away from artificial patterned drills and towards more real-life situations, in which students must determine what to say and how to say it (Díaz-Rico & Weed, 1995). Handheld scanners called "C-Pens," "Quicklink Pens," or "Pocketreaders" have recently come on the market. These can scan text, "pronounce" words, and beam information into a computer using infrared technology. The impact of this technology on learning is totally untested as far as we know.

ABE teachers can use all of these technologies, since we know that many ABE students have learning difficulties. Reading technology can help learning-disabled students build content knowledge, word processing and voice recognition can help students focus more on their ideas while worrying less about spelling and mechanics, and language labs can improve students' English pronunciation and listening skills.

Memorization

Most education researchers agree that multiplication and addition tables and correct spelling must be memorized. This information needs to be "overlearned" so that the answers come automatically, without thinking, freeing students' minds to think about and understand what they are doing. Computers can be an excellent tool for this. Thousands of drill-based programs have been developed for schools, and they are largely successful at reinforcing disconnected skills (Report to the President, 1997). Several studies have shown that students who have trouble with basic skills benefit from computer practice on a small number of items at a time (CTGV, 1996). For facts that need to be memorized, drill-based programs can provide effective practice on students' weak areas and can accelerate training. But, unlike a teacher, who can pay attention to the reasons why students make mistakes and can reteach them more effectively (Lepper et al., 1997), most computer programs can only identify which questions students got wrong and keep drilling them. This can be frustrating for students who they do not know why they are getting the wrong answer; and the computer cannot help them figure that out. So ABE teachers can use drill-and-practice strategically, to reinforce basic skills when students need more practice and more variety than they are getting from paper-and-pencil tasks.

Adult learners in particular want learning to be relevant and useful. Technology has been effective when it is used in classrooms to do real-life tasks: writing a resume on a word processor, making a household budget using a spreadsheet, or searching for health information on the Internet (Cowles, 1997).

"...do not count on educational software as a stand-alone tool."

Researchers have found that when software includes tasks in which students are interested, they learn better. For example, one study detailed young learners' experience with the *Adventures of Jasper Woodbury* series, in which students are introduced to a playground project on a videodisc, and then design their own playground equipment. They learn about measurement, scale, what details need to be included in drawings, and so on. Low-, average-, and high-achievement students all improved in a real-world test on their use of scale and measurement and on a standardized geometry test (Barron et al., 1998).

Thinking Tools

Computers have significant advantages over people in a few select areas. They can store huge amounts of information that they will never forget, they can organize and retrieve that information very quickly, and they can do very complex calculations very quickly. The newest generation of computer applications for learning uses these computer advantages to help students do much more complex problems than they otherwise could. For example, applications have been developed to teach doctors how to read mammograms (RadTutor; Azevedo, & Lajoie, 1998), to teach nurses how to manage patients in intensive care units (SICUN tutor; Lajoie et al., 1998), and to help high school students learn how to discuss policy issues (Paolucci et al., 1996). "Computers as cognitive tools" applications can allow students to test ideas, such as the effect of raising the minimum wage, by having the computer perform the huge, complex calculations that students could not do themselves. These applications have produced dramatically improved student learning and deep understanding. A few simulation applications are available from publishers of high school textbooks that could be used with ABE students, such as Addison-Wesley's *Biology Labs On-Line*. Although very little of this type of software is available to ABE teachers, it holds enormous potential for student learning in the future.

Implications

ABE teachers who want to improve student learning should keep these suggestions in mind when planning to use technology, particularly computers, in the classroom. First, do not count on educational software as a stand-alone tool. Put it in a context for students by having discussions before and after they use it. For example, the *Pig* dissection software (Pierian Spring, 1995) could be a great review after a class on inner organs, but it will not teach students by itself. Have face-to-face discussions before and after students use computers, just as you would before and after they read a traditional reading passage. This ensures that students can ask questions before they start using the computer. It also gives you a chance to find out, after an exercise is completed, if they understood the tasks they were doing on the computer.

Have students work together at the computers with other learners, or via e-mail as much as possible, so that they can help each other, learn from each other, and learn by discussing what they are doing. Give real-life assignments to students using the computer: research a business plan, produce a flyer or newsletter for the school, learn about a health problem that affects them or a family member. Teach and reinforce computer skills that require students to think critically.

Use drill software sparsely and strategically to build basic skills that need to be practiced until they are automatic. Choose drills that allow students to practice in a meaningful context.

Use the Internet to allow students to read about, hear, and see new places and things that expand their knowledge of the world. Technology cannot replace teachers, nor can it teach students on its own. Used wisely, however, it has the proven potential to enrich student learning and motivation.

Notes

1. For an opposing viewpoint, see Leu (2000), who argues that technology is changing so fast that it is impossible for research to keep up with it; therefore research cannot be very informative about technology and learning. He also argues that literacy itself is changing as rapidly as the technology, although he is vague about what the "new literacy skills" are.

2. There is an emerging consensus on how learning happens, exemplified by the 1999 book *How People Learn*, published by the National Academy of Sciences and commissioned by the US Department of Education. This model says that people learn when they relate new information and skills to what they already know, actively practice the new information and skills in a supportive environment, and get feedback on their performance. This theory of learning is called constructivism because it says that learners construct their own understanding from what they are exposed to in the classroom and what they have experienced in the rest of their lives. For other models, see George Washington University's Theory Into Practice Database,www.gwu.edu/~tip/.

3. Behaviorism is most associated with B.F. Skinner and his studies of learning in humans and animals.

4. A search of the PsycINFO database (containing more than one million articles from mainstream academic journals and books) revealed three empirical research studies and one ethnographic study published in journals and 12 dissertations. A search of the ERIC database revealed one empirical research study published in a journal.

- ☑ Put computer use in context by having discussions before and after use
- ☑ Have students work together or via e-mail
- ☑ Give real-life assignments
- ☑ Use drill software sparingly and strategically
- ☑ Use the Internet to expand learners' worlds

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Putting the National Literacy Agenda into Action

QUALITY, ACCESS, and RESOURCES are the priorities delineated by the National Literacy Summit 2000. To reach these goals, action must be taken. How can you get involved?

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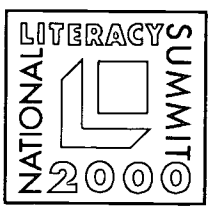


Technological Attraction

Providing instruction in computer use and using computers for instruction helped attract and retain learners

by Ralph Silva & Walter Wallace

In January, 1998, the Brattleboro, VT, center of Vermont Adult Learning (VAL), a statewide literacy and adult education organization, began the use of information technology in the classroom. We started offering classes in computer skills and, later, introduced computers as an educational tool: using them to deliver basic educational instruction. The purpose of the computer skills classes was to help students gain basic employability skills, since most jobs in our local area require some degree of computer knowledge. At first, without sufficient funds to invest in a computer lab, we used a combination of old Macs and even older personal computers (PCs) to run mainly word processing classes. Additionally, all Learning Center students had use of the computer lab during nonclass hours.

As soon as computers became available in our center, we noticed a new group of adults coming through the door: adults who had not traditionally sought Learning Center services. Perhaps of greater interest, we saw students persisting in classes longer. We also noticed something else. Our old, slow, limited computers were not meeting the needs of our learners, who told us at every opportunity that they needed more: more Internet, e-mail, e-commerce, technology, graphics, and higher-level applications. To respond to learner needs, we set about upgrading our computer lab. Working with the Vermont Community Loan Foundation, VAL acquired for the lab six new Pentium computers equipped with Windows 98 and Office 97. We offered classes in basic computer skills, word processing, spreadsheet use, and Internet with e-mail. Over time, we developed an online writing workshop, an English for speakers of other languages (ESOL) computer-assisted language learning lab, and an e-commerce class.

A Good Hard Look

Given the intensity of learners' interest in the program, it seemed natural to examine the effect the use of informational technology was having on learner motivation and persistence. We had been involved with the practitioner dissemination and research network of the National Center for Adult Learning and Literacy (NCSALL). Working with NCSALL had interested us in practitioner research, so we decided to use these methods to understand better how technology affected motivation and persistence in our program.

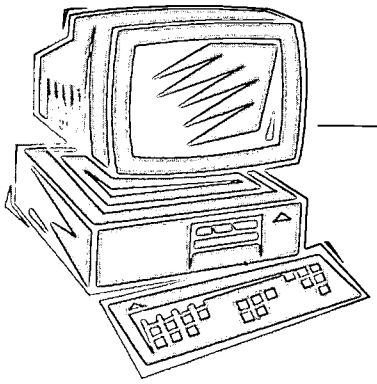
We used a combination of teacher observation and student interviews to gather information. Observational data were easy to collect, since Ralph teaches virtually all the computer skills and application classes. Walter led the integration of computers and other information technologies in content-based classes and workshops. He chose to interview students about their experiences.

Teacher Observations

Ralph noticed that about half his learners were coming early to computer class, and staying late to work on resumes and to do other job-seeking activities. This contrasted with adult basic education (ABE) students, who only came to the center during their assigned class times. Learners with school-aged children often came in with their kids during nonclass hours, to do online research together for the kids' school projects. One computer student, for example, brought her daughter to several open computer labs. She helped her daughter do web searches for a sixth grade project on African animals. Together they downloaded photos of lions, placed them in a word processing document, and formatted the photos to fit into the text of the girl's project.

Some learners who had never expressed much interest in pursuing academic skills or content seemed to view such information differently when they accessed it online. One computer and ABE student who is dyslexic and rarely chose to read in class enthusiastically did research on the Web for a writing project on the American presidency. Another computer student used the Internet to find information on area community colleges, looking through their course and class offerings for the content she sought. Some students became interested in specific content areas such as geography, history, current events, and art. They were attracted to these subjects because of the thrill of, for instance, visiting the London Museum virtually, by way of the World Wide Web.

Exposure to computers and information technology had an impact on at least two students' career development and direction. We take computers apart and put them back together in basic computer class as a way to demystify what's in the box. One basic computer student



discovered a talent in the area of computer technology. He went on to receive further technical training, and is now, a year and a half later, an A+ certified technician. Another student took classes in basic computing and word processing. We worked collaboratively with the state vocational rehabilitation agency and a local microbusiness development project to integrate this learner's new information technology skills into a small motorcycle repair business. He now has an online business buying and selling motorcycle parts as part of his enterprise.

Interviews

Walter interviewed 45 basic computer students, 27 of whom are women. Access to computers attracted 36 students to VAL programs. All the learners he interviewed identified computers as vitally important for learning, personal use, and for getting a good job. One learner pointed out: "I can now do things I couldn't do before. Computers are everywhere and you have to know how to turn them on and use them to get a good job. I want to work in an office. All the jobs I hear about are ones that you have to know how to use a computer. It's like everyone has to know how to use them. I have to use them to get a good job."

Another ventured: "All the jobs out there say you have to have to use a computer so I wanted to learn."

Some of the interviewees' comments also reinforced our belief that the availability of computers was helping us to attract and keep learners. "Computers are everywhere and I can talk to people I never knew. I like games. I always feel like I'm in control. I like learning new things on the Internet and to meet people," said one learner.

"...we did not imagine that students would respond as they did: becoming self-starters, taking over their own progress, and expanding their uses of computers into academic and other interest areas."

"Computers make learning fun and I like to work with the computer all morning [in class]. Time goes by fast. I don't even know how long I'm working at the computer but I just know that I am learning something new every time I sit there, like how to make the computer do things I didn't know it could do," observed another learner.

A Learning Experience

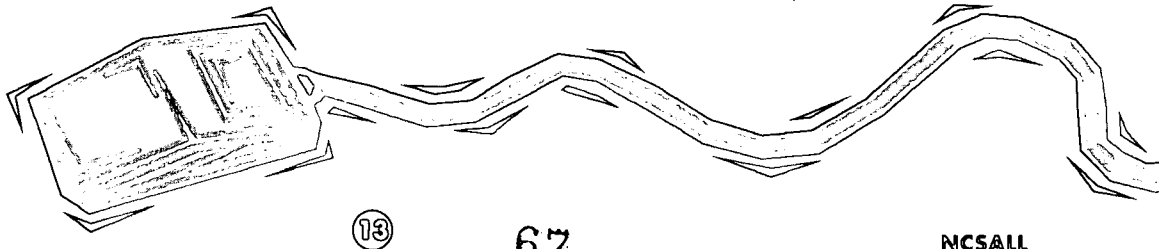
At the start of this pilot program we expected to teach general and job-oriented computer skills. While we also expected to draw students into a deeper interest in the world of computing, we did not imagine that students would respond as they did: becoming self-starters, taking over their own progress, and expanding their uses of computers into academic and other interest areas. Given the results we have found, we intend to capitalize on the program's success.

Our plans for the future include expanding the scope of computer instruction by making it a regular aspect of all ABE and credentialing classes. We want to help all our students become comfortable using computers on a regular basis. For instance, new intermediate- and advanced-level students will use our computers to register for our services. Also, we constantly look for good interactive reading, writing, math, and content programs on the Internet, and plan to use these resources more over time. We already have formal and informal e-mail writing, tech help, and discussion groups for students with access to computers. We want to increase those activities, and to increase student input in our program's web pages. We hope that through the creative use of computer technology, we can continue to engage new students and then keep them motivated and interested in furthering their education.

About the Authors

Ralph Silva has been teaching at Vermont Adult Learning for five years. In addition to the basic and applications courses at the Brattleboro Learning Center, he also teaches computer technical certification and web page design classes at the Hands-On Computer Learning Center in Brattleboro.

Walter Wallace is the former director of the Brattleboro Adult Learning Center, where research for this article was done in 1999. He now coordinates nonclinical curriculum development and internal reviews as a staff member of the Graduate Medical Education Department at Dartmouth-Hitchcock Medical Center in Lebanon, NH.❖



Teaching ESOL Using Word Processing: A Communicative Approach

by Steve Quann & Diana Satin

At first, we introduced the use of computers to our English for speakers of other languages (ESOL) classes with little forethought. We saw computers simply as the means by which students could launch educational software, and as a tool they could use to create resumes and cover letters. As we sought ways in which to integrate technology into our courses, we found that while learners were mastering the basics of word processing, using computers helped them in many aspects of language development. Despite the range in our students' language abilities, common principles emerged in the value of computers to their education

We began to integrate technology into ESOL when Steve taught an intermediate ESOL class in 1996 at La Alianza Hispana in Roxbury, MA. Fourteen recently purchased Pentium computers sat ready to be utilized in a newly created computer lab. Steve himself was not very comfortable with computers. He was learning Microsoft Word, having previously used WordPerfect, but he was enthusiastic about augmenting his classes and bringing new technology to his students. The majority of program participants came from either Latin America or Cape Verde, and had varied educational backgrounds and levels of computer experience. Most had attended high school in their homelands; a few students, although more advanced in their oral English, had had very little or no formal schooling.

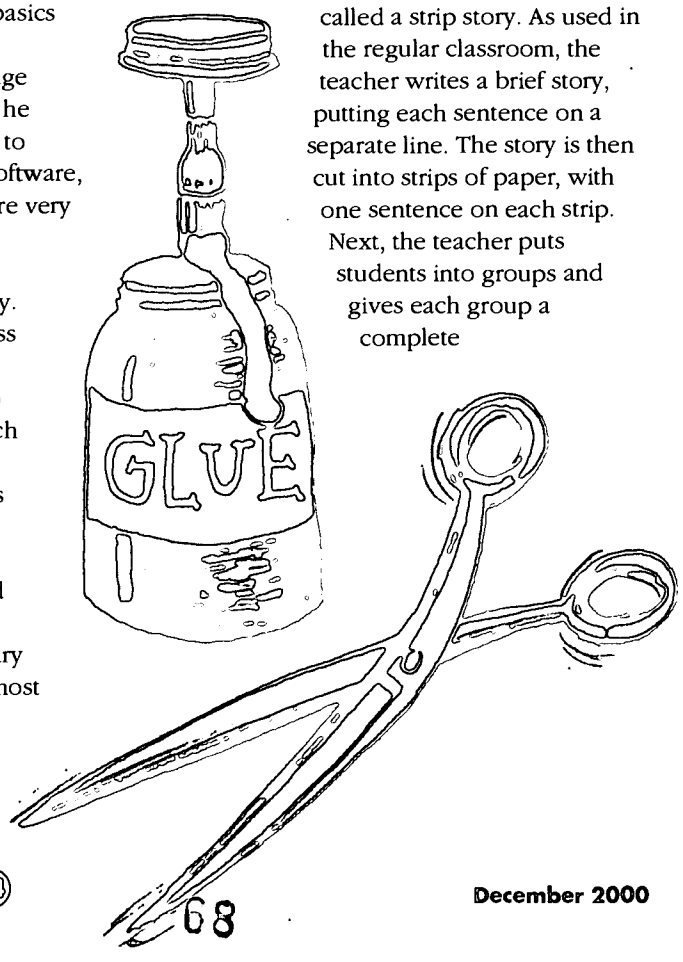
Some students knew the basics of computing while one or two had never even touched a computer. Most of the learners required instruction in and practice with introductory computing skills: turning the computer on and off properly, using the mouse, and keyboarding. Steve realized that all students needed to become somewhat proficient in these areas before they could adequately utilize educational software, navigate the Internet, or do any basic word processing.

At first, Steve saw his role as computer instructor: teaching computer basics without integrating much, if any, language learning. Later, after he introduced the class to language-learning software, students initially were very excited, but the enthusiasm soon diminished markedly. He surveyed the class as to why they no longer wanted to go to the lab for as much time as they had before. The students responded that they felt that computers were interesting and helped in their practice of vocabulary and grammar. Yet, most said, they were coming to class primarily to interact with each other and not with a computer. Their ultimate goal was to speak English, and the more they went to the computer lab, the less opportunity they had to practice conversation.

Pair Approach

Steve honored their wishes about reducing the time spent in the computer lab, but wondered how they could take advantage of the technology in less than one hour a week. He began to explore new ways to utilize the computers. Since there were not enough software CDs for everyone, students had already been sharing computers. If they continued to share computers, they could work on a language activity for pairs of learners that he would have normally used in the classroom. They could achieve their goal of interacting with each other rather than focusing on the technology.

One of Steve's first pair-approach activities involved a time-tested ESOL sentence-sequencing activity called a strip story. As used in the regular classroom, the teacher writes a brief story, putting each sentence on a separate line. The story is then cut into strips of paper, with one sentence on each strip. Next, the teacher puts students into groups and gives each group a complete



ERIC

set of the scrambled strips. Learners collaborate in creating a coherent story: they work on the skill of sentence sequencing while also practicing speaking.

Steve saw how learners could use the word processing program's Cut and Paste function to reorder the sentences. In the first part of the class, he taught the students how to use these functions. The learners then spent the rest of the time on the communicative aspect of the activity: working in pairs to decide the correct order of the sentences. This combined language practice with instruction in a computer function. Steve did some pre-teaching activities to introduce the concept of Cut and Paste. He brought in scissors, paste, and paper with sentences written on it, and had students cut off one line from the paper and change the order of sentences. This seemed to jump-start the learning process and helped students to understand the task. Halfway through the class, Steve realized that he should have started with a review of some of the prerequisite computer skills, such as clicking and dragging to highlight (select) text. This experience confirmed that it is just as important to do a well-thought-out "precomputer" activity before working on a new computer skill as it is to do a prewriting activity before working on a writing piece.

Steve also learned that it took more time than anticipated to demonstrate computer functions. At first he spent a lot of time running from student to student, helping each to get to the correct screen, while others waited in frustration or went ahead and perhaps got lost themselves. He realized that it is a good idea to make sure that each student moves together with the class, and to wait until everyone catches up before moving on to the next step. In other classes, he found that this was especially important during the earliest stages of computer use.

Steve's program had purchased a projection device, which he used to project the image of his computer screen on the wall, for his students to view. This allowed learners to interact with information in three different ways. They heard the explanation, saw the steps involved, and did what the Steve was doing as he gave instructions.

Although many students were anxious to learn word processing, Steve stressed that the primary focus of the class was not computing; learners were engaged in a cooperative language learning activity. They were working on an English project and learning computing as a tool. He encouraged students using computers by themselves to lean over and work with the classmate next to them.

A week after being introduced to Cut and Paste, Steve's class went back into the lab to create their own sentence-sequencing activity. Most of the class needed more practice. Nevertheless, they had achieved their stated objective of increased conversation, and they were also becoming comfortable with the basics of computing. By the end of the project, most students felt that they were learning to use a tool that would help them at work, home, and at school.

Our Observations

Diana began to use this approach with her intermediate ESOL students at the Jamaica Plain Community Centers' Adult Learning Program (Jamaica Plain, MA). When less experienced computer users were paired with the more experienced, they could listen to the more advanced learner give instructions while applying them on the computer. The more advanced computer users could use English to communicate what they knew,

Sentence Sequencing using Cut and Paste

Language Objectives: Reading, sentence sequencing, discussion.

Computer Prerequisite: Click to open documents on desktop, line return, highlight.

Preparation: Type at least five sentences, one sentence per line, into a word processing program, naming it *check*. (This can be a story, a recipe, directions, or a list of historical events on a theme or area of interest that the class is already prepared to read about.) Then reorder it and name it *scrambled*, saving both documents on a disk. Load both documents onto the desktop of each student's computer. Prepare an additional "short list" of words or sentences to use in your initial demonstration of cut and paste. Bring paper, scissors and paste.

Activity:

- Introduce the vocabulary and concepts of Cut and Paste using real items such as scissors and paste.
- Review prerequisite knowledge such as highlighting/selecting text as well as the topic of the reading.
- On the computer, demonstrate how to Cut and Paste using your "short list" document.
- In groups of two or more, students open the file named *scrambled*.
- After reading, students discuss the appropriate order of the sentences and use the Cut and Paste function to reorder them.
- When each group is finished, students discuss with the whole class the order they chose and why. At this point they can check the original document (the document named *check*). As a follow-up project and for those that finish early, have each student create his or her own paragraph, reorder it, and have the class put it in an appropriate sequence. ❖

practicing commands and bringing computer terminology into their working vocabulary. Students' incorporation of new vocabulary was evident in their improved ability to comprehend and follow instructions. Overall, those working jointly needed to ask Diana fewer questions about how to do the activity than did those working alone.

As learners worked together on the language aspect of the activity, they were also practicing grammar, vocabulary, and other communication skills. Students' overall fluency rose as they collaborated on group projects. A colleague who observed a class said he had never seen so much conversation in a group activity before. In both our classes, students' comfort and interest in working with computers grew. Learners' independent initiatives in the lab indicated their growth in confidence. Students no longer waited to be told to turn on the computer. Even before class started, they entered the lab, opened up programs, and began practicing their typing. People who initially were not confident working with computers were now more eager to engage in these activities.

The excitement and pride students feel is evident when they see the final draft of their writing projects come out of the printer. However, there are disadvantages to using word processing in a project. Students unskilled in typing are often hampered in their efforts to write their ideas down freely. Limited experience with keyboarding and with using word processing functions also can lead to frustration when learners attempt to make changes to their work.

Developing a Curriculum

As we worked with our classes, we noticed that the students' overall knowledge of computing had a Swiss cheese quality to it: strong abilities and knowledge coexisted with surprising gaps. We had been using a predominantly constructivist approach to technology, in which the learners constructed knowledge by assimilating new experiences. The class decided on a theme, we introduced the computer skill necessary for a particular lesson, and then learners worked on discrete tasks, group activities, and writing projects. We had not considered the sequence of the computer skills needed to complete the task. For example, when learners were ready to create a final written product, we needed to teach such skills as how to make capital letters, format and edit documents, and save them. We spent an inordinate amount of class time on teaching the computer rather than language skills.

"Students' overall fluency rose as they collaborated on group projects."

This showed us the value of incorporating an instructivist approach: sequenced, direct instruction. By teaching word processing skills cumulatively, and in a sequence that made sense, students could fill the holes in their knowledge of word processing. We developed a good idea of what computer skills the students already possessed at a particular time, and knew what computing activities they would be able to handle. We could then take the ESOL curriculum for each of our classes — including appropriate content, grammar, and language competencies — and integrate them with computer topics that ranged from the names of the parts of the computer to the basics of word processing techniques.

Low Literacy Levels

We had initially thought that the integration of computers should await students' mastery of survival-level English. However, as more and more beginning learners asked for computer training, we began to adapt the lessons to their language needs. By adjusting the vocabulary and grammar structures, we found we could accommodate different levels of language proficiencies.

Diana accepted the position of Computer Instructor for beginning level ESOL at the school where she taught ESOL. Her students, from all over the world, comprised a range of abilities in reading, writing, speaking and listening. She wanted to use our approach to shape her course, so she began to adapt the book we had written — *Learning Computers, Speaking English: Cooperative Activities for Learning English and Basic Word Processing* (Quann & Satin, 2000) — for the language needs of very low level learners. She gave some thought to lessons that incorporated more basic language skills.

Before developing a plan for the course, Diana spoke to the ESOL teacher of one of the low-level classes to determine on which language skills students in those levels needed to work. The teacher mentioned that learners often confuse several similar-sounding letters: I, E, and Y; and C, S, and Z. In keeping with our idea of fostering communication among students, Diana developed a lesson that helped students learn about single clicking and to differentiate letters at the same time. For another lesson, she used a modified version of the Total Physical Response approach, in which she gave

instructions, demonstrating as she spoke, and the students mimicked her actions on their computers. See the box for the instructions she gave and modeled.

When students did not understand what to do, a student who spoke their native language explained the instructions in that language. The assistant computer instructor and Diana circulated and assisted pairs with computer functions or language when necessary. Students sitting next to each other leaned over to see their partners' screen to read the name of the letter while the student sitting at the computer repeated the name and clicked on the folder.

After trying this lesson out in three computer courses, Diana saw that it helped students learn to control the mouse better. Students said that they appreciated learning to discriminate the names of the letters and could communicate using them better than they had before. This indicated to us that learners, including those at a low literacy level, value the usefulness of both the language and the computer aspects of a lesson, and are able to succeed using technology in the classroom.

Conclusion

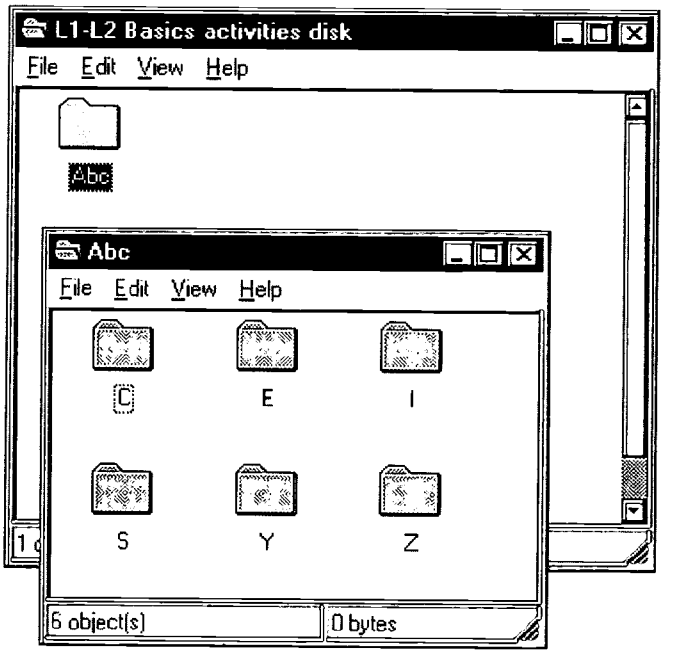
Our experience demonstrated that much of what we consider to be good pedagogic practice in the regular classroom can be adapted to the teaching of ESOL using word processing. As in any learner-centered classroom, we found it helpful to assess the language and computing needs, as well as the interests, of students before beginning. We learned that considerable thought has to go into teaching the progression of skills in computer use and word processing, and that we must carefully analyze which prerequisite computer skills students must know before they can engage in a new project. Going to the

Letter Discrimination using Single Click

Language Objectives: Letter discrimination

Computer Prerequisite: Names and functions of computer parts, turning on the computer, the desktop, what a folder is, moving the mouse.

Preparation: Bring enough disks for each student pair. Create a folder and name it **ABC.** Within that folder, create six more folders, each named with a different letter that students confuse. (See illustration.)



Have students form pairs and take turns sitting at the computer.

Activity:

- Give each student pair a disk. Have them locate the floppy disk drive (drive A on most PCs, A:\ drive using DOS) and insert the disk.
- Students click on the My Computer icon on the desktop to select it, and push the Enter key once to open it. Explain that this is called a window, and that it's the same as opening a window so they can see what's inside the house, the same as opening a book to see what information is inside.
- Students click on the icon that represents the floppy disk drive, and push the Enter key. Point out that this opens another window.
- Students click on the folder named **ABC.** Then press the Enter key. Tell students that this opens another window.
- In that folder students will see folders with letters under them.
- One partner reads a letter and the other one repeats the name of the letter and clicks on it. Take turns.
- Students close the windows by single clicking on the **X** in the top right corner of the window.❖

computer lab only once a week demonstrated to us the need to reinforce recently learned computer skills. Working in pairs helped students to feel comfortable in meeting the challenges inherent in learning new computer functions, and provided a wonderful opportunity for language practice. Most significant was our successful use of communicative language-learning activities in the computer lab, through both instructivist and constructivist approaches. It made sense to spend time on communication activities that help in the teaching of a particular computer function before embarking on a project. Doing this, students are not simply taught a computer skill to complete a project, but also learn English in the process.

We believe that the useful integration of technology into ESOL instruction requires the advancing of learners' computer and language skills simultaneously. This empowers students to achieve both their educational and career goals and helps them feel more a part of our increasingly technologically oriented society.

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About the Authors

Diana Satin teaches ESOL as well as computers at the Jamaica Plain Community Centers' Adult Learning Program in Jamaica Plain, Massachusetts.

Steve Quann teaches ESOL at Massasoit Community College and is webmaster for the New England Literacy Resource Center at World Education in Boston. ❖

Why Integrate ESOL and Computers?

Students say that integrating word processing and ESOL helps them progress toward their goals. For example, one goal of many of our students is to improve their job opportunities. Our integrated approach teaches skills that help them with data entry and with such word processing tasks as creating professional-looking resumes and cover letters. They also learn other software commonly used in offices, such as PowerPoint. Others learners use these skills in pursuit of their educational goals. They learn the value of computing when they use instructional software, access educational web sites, and write reports for college courses or work assignments. Many have appreciated their newfound comfort with computing for personal benefit, including e-mailing, finding community information on the Internet, and assisting their children with homework projects.

We also believe that integrating word processing and ESOL meets many of the objectives set out by the Secretary's Commission on Achieving Necessary Skills (SCANS, 1991). The Commission surveyed businesses and education leaders to find the skills important for adults to possess to succeed in the workplace. Among many workplace competencies and foundation skills, the basic skills related to language have a significant place in the combination of ESOL and word processing. Thinking skills such as thinking creatively, solving problems, and knowing how to learn new computer functions, such as using the Help menu, are life skills. These are developed when students work together on integrated computer and ESOL projects and activities. In the skill area of personal quality, we have seen how students who came into the lab initially frightened and nervous around computers, which they saw as mysterious, complicated and beyond their capabilities, have developed greater self-esteem after they gained the confidence to use computers independently. Students develop their interpersonal skills when they work in pairs or small groups, often with people from different cultural backgrounds. Because pair work encourages interaction, students teach each other constantly. Students learn to process information using a computer, to understand the technological system of the computer, and to apply technology to specific tasks through such activities as typing lists, writing memos, composing business letters and structuring resumes.

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A Conversation with FOB...

Low Tech: Calculators, Videos, and the Abacus

Technology can be both a tool and a source of motivation in a GED math class

G. ANDREW PAGE (Andy) ***taught mathematics to those preparing for the tests of General Educational Development (GED) at the Richard Arnold Adult Education Center Math Lab in Savannah, GA, for more than eight years. He used a number of "low tech" tools in his mathematics instruction, including calculators. We talked to him about why he did this and what tips he has for others interested in doing the same.***

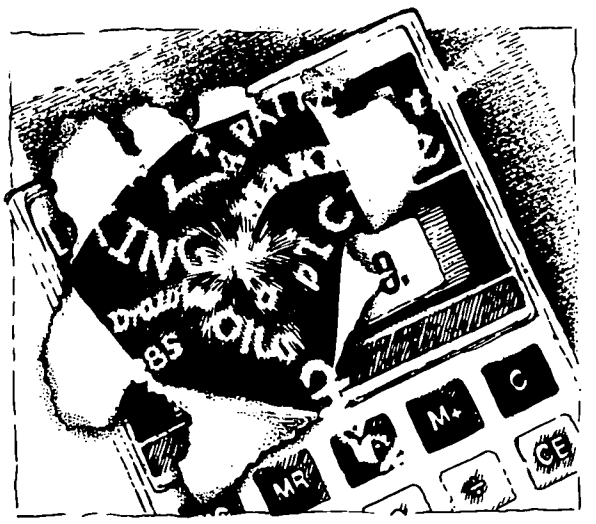
FOB: *What made you decide to teach learners to use calculators?*

GAP: Well, I was teaching general math, algebra, and basic geometry, to GED [General Educational Development] prep students who were pretty advanced, above a sixth grade level. They knew the four functions [addition, subtraction, multiplication, division] although they all didn't know their basic math facts automatically. It had been many years since some of them had been in the classroom. But, as I said, they knew the four functions, and some of them knew how to use calculators for those functions. Some of them were using calculators in their jobs.

Some people asked for them [calculators]; some brought them in, so I decided to teach them formally. This meant I had to get the same calculator for everyone, because sometimes calculators [from different manufacturers] label the functions differently. I got a grant to get everyone the same calculator.

FOB: *Did you have to convince any of the students that it would be worthwhile to learn to use a calculator?*

GAP: Oh, yes. I had several students who were resistant: they insisted on learning the old fashioned way. They wanted to be able to do it in their heads. They didn't want that tool.



I showed them the speed the calculator offers, and that the computation is not the important part. Especially with word problems, the calculator won't tell you the answer: garbage in, garbage out. I had to tell them that it was not cheating. We also compared it [calculator use] with computers: that computers supposedly simplify our lives, but if you don't know how to use them, they don't. The underlying message was that I am going to teach you to use it effectively.

FOB: *Did their peers help your cause?*

GAP: They encouraged each other. I had one guy who worked as a maintenance worker. His company wanted him to carry a calculator around in his shirt pocket.

FOB: *Any drawbacks to calculator use in the classroom?*

GAP: You don't want calculator abuse. [Students shouldn't use calculators] for things like 6 x 7, for example. It's incumbent upon teachers to facilitate a classroom where you don't have calculator abuse. You have to be proactive, to model which problems they should use the calculator for and which they shouldn't. Show the importance and logic of estimation, ask why we use division, why we use multiplication. Until they know, learning has not taken place. When they can tell you why, that really helps them.

FOB: *Is there a "right time" in which to introduce calculator use?*

GAP: Using the Socratic method, asking why, I model a computational algorithm, then I show a word problem relating to that, then we

work a similar problem with a calculator. I allow time for [learners] to offer real world problems that they have encountered. Usually these dealt with personal finance, such as figuring sales tax or computing the simple interest on a loan. Sometimes I show that the brain would be faster than a calculator: mental math. But we need to get away from drill and kill. Math is not just about computation, it's about thinking and exploring.

It's good for the teacher to show an example. Savannah is on the Atlantic. I go to the beach. I wonder, "How far is it to the horizon?" You can do this any place you have a flat surface in front of you. You take the square root of the height and multiply it by 1.4. Would you want to do that by hand? We would do it estimating, then we do it on the calculator, getting the square root of the height using a function key.

Function keys on a calculator look intimidating. The students were excited when they learned the use of a new function key: the x-squared key, for example. Instead of 6 x 6 you just hit x-squared. They could be very adventurous. I would hear "I always wondered what that meant."

FOB: *What tips do you have for math teachers?*

GAP: One of the things about calculators is the "coolness"... This connects to my philosophy of teaching: whatever it is, however you do it, make it fun. Show interesting things. There's no aspect of math you can't apply to the real world, so find it and show it.

I taught the abacus; that's a tool, too. I would show them different algorithms for multiplying. I showed that video of the man who can do mental math in his head. I didn't want them to become technology dependent to the point where they can't think by themselves. Technology is both a tool and a motivator.

Building a Web Site in an ABE Class

Building a web site allowed everyone to demonstrate their skills

by Maura Donnelly

In the spring of 1999, my class and I created a web page (http://hub1.worlded.org/docs/gb/default.htm). The verb "create" is a bit misleading. We argued, designed, wrote, rewrote, and wrote again, fought, laughed, explored, compared, criticized, and finally gave birth to our web site, which some of us still fuss over like new parents and of which all of us are tremendously proud. I say this because I want to avoid giving the impression that this project was a breeze. I want to avoid generating in readers the feelings of self-doubt that I experience when I learn about innovative projects and best practices that seem to come off without a hitch. I find that that rarely happens. It is from hitches that I learn about my students and about myself as a teacher. So, while creating a web page was not easy, it was a memorable and creative learning experience for myself and for my students.

Who We Are

Our class was located at the Adult Learning Center, LaGuardia Community College, in Queens, NY. The students were members of the local community who came to the center to improve their reading, writing, math, and English skills and get their certificates of General Educational Development (GED). LaGuardia offers four levels of pre-GED classes that lead up to actual GED preparation classes. Our class was the second level within this four-level system. The overall pedagogical goal of the class was to provide opportunities for the learners to successfully interact with and create written texts. Our work focused on reading for meaning; tracing character development and motivation in fiction; identifying and understanding the roles of nouns, verbs, and adjectives; deconstructing and understanding sentence structure and consequential changes in meaning; creating sentences of varying length and structure; and writing descriptive, narrative, and personal stories. In addition to our web project, we were reading poetry and fiction and developed a relationship with an author.

At the beginning of the year we took a poll and discovered that 18 different languages were spoken in our class of 20 learners. The 17 students who had not been born in the United States had been here anywhere from six months to 20 years. The age range in the class was from 19 to 58. Some had child care issues, others had adult children and grandchildren. The class was composed of an equal mix of men and women, with most of the men younger than 30 while the women spanned the age range. Most of the students worked: as house cleaners, deliverymen, office assistants, janitors, textile workers, and hairdressers. A few students did not work because they were the primary caregivers in their families, were unable to find employment, or were supported by their families in their native countries. Most of the

students cited attaining a GED as their goal.

The class met for nine hours a week, of which one-and-a-half hours a week were spent in the computer lab. The first day of class, I polled my students on their expectations for the class, their personal goals, and their interests. The interest in "learning computers" was overwhelming. The students had widely varying levels of comfort and familiarity with computers and with the Internet. A few students had never used computers and were, in the beginning, almost paralyzed with fear that they would break the machines. Some students frequently used computers, already had e-mail accounts, and were adept at surfing the Web. I was very comfortable with computers, e-mail, and the Internet, and had been using them at work and at home for a number of years.

The Project

The aim of our work in the lab was to motivate and encourage the students to write and write some more. Our first few weeks in the computer lab were spent reviewing the basic components of a computer and their functions. I paired the novices with the more proficient students. As everyone mastered basic computer techniques, we quickly moved on to word processing and writing. Students created first drafts of their personal stories on the computer, revised and edited them, and designed texts using various font styles, sizes and colors and clip art. Depending on the student, this process took one or many sessions. During this time, the students signed up for their own e-mail accounts and I began to e-mail their assignments to them each week.

Students were e-mailing each other and me at an alarming rate. I received numerous e-mails not related to assignments, and held many ongoing dialogues with students via e-mail. I wanted students to be engaged in writing and to write more: they were certainly doing just that. In the late winter, after we had been using the computer lab for four months, I introduced the idea of a virtual school visit project

"The aim of our work in the lab was to motivate and encourage the students to write and write some more."

(http://www.otan.dni.us/webfarm/emailproject/school.htm) as a natural way to continue and extend this engagement in writing. In a virtual school visit, two classes come together to be key pals, the term used for electronic pen pals. Every type of class (adult literacy, English for speakers of other languages [ESOL], K-12, and GED) from anywhere in the world is invited to participate. The participating students exchange e-mails and eventually each class creates a web site that is framed as a tour of their school for their partner class.

The structure of this project was ideal for my students. First of all, to communicate across a distance using writing was new for them. They did not generally write letters. While some students were already using e-mail to communicate with people outside of our class, this gave every student the opportunity to develop a relationship with someone simply using words. They loved the idea of having key pals and immediately began to talk about what they wanted to learn from a class in California. Secondly, the prospect of creating a web site, while daunting at first, intrigued many of the students. We had been using the Internet to do research during the year and we had looked at some student-created sites. Students had expressed an interest in creating their own site, in getting their writing and voices out there.

As a group we discussed what would be involved in building a site, what we might want to have on our site, and any reservations we had about making the site. After a week we put the idea to a vote and the class decided to participate in the project.

Getting Started

We started with key pals. Our partner was a class of six ESOL students in California who spoke Spanish as their first language. Much of our work was done in the classroom. We brainstormed what we wanted to know about our Californian key pal class and what we wanted to tell them about us. Because of the disparity in class size, groups of my students each partnered with one of the California students. My students wrote their first e-mail as groups in class and the next time we went to the computer lab one from each group typed it in and sent it off. The students, who earlier in the year had rejected letter writing, were excited about crafting good letters and anxiously awaited their partners' responses. By the next week, the California students had responded and the communication was underway.

We began to explore the possibilities of creating our own web site. We used a focusing question to guide us: "If our key pals were coming to visit, what would we show them?" First we talked about the level of detail we would show. Were we talking about a visit to our school, our class, our city, our borough, or our homes? Some students wanted to get personal and show their homes, family, friends, and workplaces.

Nazeela

Hello! My name is Nazeela Hafeez. I am from Guyana and I attend LaGuardia Community college. I am going to this college to get my GED and go to college. Last year I was in Maura Donnelly's class. She brought up the idea to our class of making a web site. She asked us how we felt and what we thought about building our web site. It was a great idea because not everyone knows what a web site is and how important it is.

The main idea of this web site was to share our writing on the web. I was very horrified because I knew that my writing was not that good and I didn't have much confidence in myself. Anyway we started doing some research about how to build a web site. It was not much fun in the beginning because not everyone knew how to do research about building a web site. With the help of Maura and the computer teacher, Nina, we were very successful in our research about building this site.

From building this web site I can say that I learned a lot of important things. For example, I now know what a web site is and what it means. It lets you share your story, thoughts and experience. It helps you get whatever information you need. The most important thing I would like to say is that fear stops people from doing things. My advice to people out there is don't let fear take you over. At first it was very hard for me. I did not have any confidence in myself at the beginning. But as I went on and put my mind to it, it got easier. I feel much better about building this site and sharing my thoughts and my experiences.

About the Author

Nazeela Hafeez is a student at La Guardia Community College's Adult Learning Center in Queens, NY. Once she attains her GED, she plans to continue her education.❖

Other students wanted to show pictures of our class, our computer lab, and fellow students and include examples of our writing. Still others wanted to show the visitors New York City and especially our borough, Queens. We had much discussion about this; the students' individual pages reflect this diversity of thought.

As with the writing of the key pal correspondence, much of the actual work for the web site took place in our classroom, not in the computer lab. We wrote about and discussed what we wanted on our site and then worked on particular pages. Once we had decided on some basic components of the site — a first page, individual pages, e-mail with our key pals, local landmarks, and our school and class — we set about designing the site. This design work included the aesthetics of the site as well as its navigation and flow. This last component, the flow, was possibly the most difficult aspect for students. We placed ourselves in the mind of the visitor and, with all of the components of the site on the black board, we asked: "Where would I go next?"

A large part of this design process was critiquing other web sites; mostly those made by or for adult learners (http://members.aol.com/ansongreen/tour.htm, http://www.geocities.com/CapitolHill/1064/, http://home.earthlink.net/~sgaer/home.htm).

I e-mailed URLs to the students and asked them to review the web sites based for the strengths of their design. We used these questions to frame their analysis:

- Is it easy to move around this site?
- What do you think of the background color and the color of the fonts?
- Can you read this easily?
- Do you like the use of pictures?
- What would you change about this site?
- What about this site do you think we should try to include in our site?

Working individually or in pairs, students reviewed the sites with one of these questions in mind and e-mailed their thoughts to me. Students were generally able to assess and critique other sites, given these focus questions. Without any such guiding questions, students often wrote back that they liked or did not like a site or that they thought a site was nice.

From the beginning of the project, students were adamant about having pictures on the site. We could get access to a digital camera through the college but opted instead to supply the students with their own disposable cameras. A digital camera would have been easier from a production point of view: it would allow us to simply download the images directly into the computer. But disposable cameras allowed the students to carry cameras with them and snap pictures as they went about their lives. I applied for and received a mini-grant to cover the cost of the disposable cameras and processing. The students had to pick four or five shots each to put on their individual pages and write captions for their pictures. This short writing task proved to be relatively easy: it was writing about something with which they were connected. The captions were a fun break from the longer pieces of writing they were creating for the site.

A Hitch

We had all of the raw stock for the site: student photos, photos of class events and trips, original student writing in the form of captions, introductions, short pieces created during the year, each student's end of the year writing celebration piece, and our e-mail conversations with our key pals. We were ready to put together our site. My vision was that after a brief tutorial on Front Page, a web editor that allows the user to

simply drag and drop images and text onto a page and easily arrange them, each student and I would work together and create each student's page. I blocked out two computer lab sessions, or a total of three hours, to do this work. This did work with students who had all of their components ready, but it took much longer than I planned. In the end, only a few students were able to lay out their own pages. The remainder of the layout I did myself after the end of the term. Students were still handing in their chosen photographs and their final writing on the last days of class. This led to hours of extra work for me scanning photographs and laying out pages.

I was a bit disappointed because not only did I not enjoy doing this extra work but I also wanted the site to be up and finished by the end of the term so we could celebrate it as a class. Although I notified all of the students when the site went up, I feel there was no true group closure on the project. And because some of the layout occurred without their involvement, I questioned, to some degree, the students' true ownership of the project.

Issues

Because LaGuardia operates on a three-term system, seven new students were introduced into the class in April, 1999. We had to stop our process for two class meetings and focus on welcoming these students and introducing them to the project. To be truthful, this makes me feel a bit dishonest in touting this a project as truly student-centered. The new students did not really have a choice as to whether or not they would like to create a web site. The class was invested in the project: we never considered reassessing and perhaps scuttling the project to generate a new one. Of course, once they were involved, the newer students had as much influence on the course of the project as anyone else in the room.

This brings up another point about the potential tension between a classroom project of any length and the often transient nature of the adult literacy classroom. Looking at the site, you can see that students were participating in the class and consequently in this project to varying degrees. Some students have completed individual pages with their own captioned photographs, original writing, and a link to their reading in our end of the year writing celebration. Other students only have a picture of themselves with an introduction of a few sentences. Some students appear in the pictures of all of our field trips and events and others may only be in one picture. This does not undermine the value of the site nor the students' individual pages. Their pages reflect their abilities, during that time period, to participate in the class and in this project.

The purpose of this project was not to make my students into web designers but rather to encourage them to write and give them a vehicle for publishing this writing. This said, many students were also interested in learning about computers in general and wanted to be involved in all aspects of the project, including the more technical ones. Therefore, some of my time was spent exploring technology for technology's sake with interested students while the other students worked on their personal writing or design aspects of the site. I was highly conscious during this time to not let the allure of technology overwhelm the true goal of writing but rather to use this allure to motivate students to read, research, and write.

Rewards

One of the goals of this class was to give students successful and engaging experiences with text. Many

Fatma

Hi! This is Fatma. I'm in a pre-GED at LCC. It was my first day in class. I felt like a stranger and I was very shy until I met my pre-GED teacher, Ms. Donnelly. During the first month in the class, I became very confident because of her.

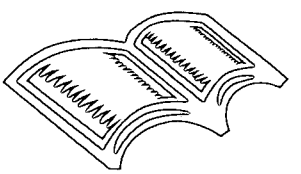
We did a lot of activities and also we made a really cool web page. I was very happy because I've never made a web site before, not even in high school. I was excited. We took pictures, wrote about ourselves, and put them into the homepage. The purpose of doing it was so when we finish the program and we go to college, we will have a chance to keep in touch with our former classmates and we will remember the memories of what we did in these days.

It was such a good idea to make a web site. I really enjoyed it. I show the web page to my family, my fiance, and friends. Whenever I show this WebPages to others I feel good about it.

Nowadays, I am really involved with computers. I learned how to make a web page, search for information for my homework and to type with ten fingers. I am proud of myself and I'm thankful to my teacher, Ms. Donnelly.

About the Author

Fatma Karakas is a student at LaGuardia Community College's Adult Learning Center. She is originally from Turkey and has been in the United States for nine years. She is interested in working in the travel and tourism field in the future.❖



of the students did not view themselves as effective readers and writers. They saw interacting with text as a hard struggle and certainly not something that could be fun and rewarding. During this project, students read and assessed other web sites, read and peer-revised each other's writing, and used writing and e-mail to communicate their ideas and thoughts. All of this literacy work was done for a purpose the students had decided upon, designed, and implemented.

"We all took on the roles of expert and novice, apprentice and master."

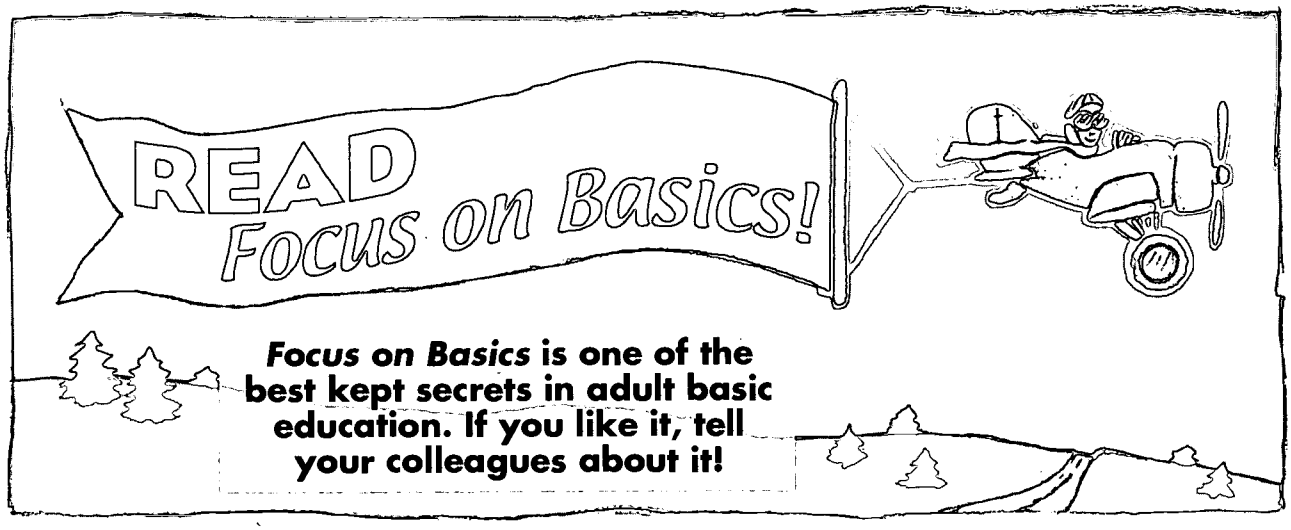
The creation of this web site is, for me, an example of a project-based learning activity. In project-based learning, students and teacher work together to explore a topic and create a product. The complexity of this project demanded various skills and strengths: writing, humor, linear and nonlinear thinking, leadership, research, an understanding of the World Wide Web, consensus building, e-mail, critical thinking, photography, and all aspects of design; and students were given the opportunity to share their talents. One student who understood how to use the cameras demonstrated this for the others. A student who was very efficient and personable was able to effectively lead the class through some decision-making sessions. Some students were diligent and resourceful about gathering various types of information about New York City landmarks. Students who had a strong sense of the navigation and flow of web sites were able to explain and illustrate this for the students who were not so web savvy. We all took on the roles of expert and novice, apprentice and master.

This collaborative and dynamic environment allowed students to use their strengths as a foundation for their learning. They had demonstrated to the class, and perhaps to themselves, that they had a skill or a talent and this made the exposing of any weaknesses easier. Students were comfortable sharing their writing with the class and participating in peer revision and critique. This environment also allowed me to truly take on the role of facilitator. I was not the keeper of all of the knowledge in the room; I became one of a rotating group of teachers.

The site, while not a current project, is still a fluid, changing entity, which continues to act as a catalyst for student writing and pride. Once the site was up and the students were able to take a look at it, many wanted to make changes. Some did not like their photographs and planned to bring in a new one or they wanted to add captions to their pictures. Students often contact me at school or via e-mail about the site. In addition to my pedagogical goals of having my students successfully interact with text and engage in more writing, one unexpected outcome of this site is that it allowed the community of our class to continue. This community now has a life that is not bound by our classroom nor by our student-teacher relationship. We are a group of people who struggled to create something of which we are proud and that will continue to connect us.

About the Author

Maura J. Donnelly is an adult literacy practitioner at LaGuardia Community College in Queens, NY. In addition, she has been a program development assistant at the Adult Literacy Media Alliance (ALMA) for the past three years. ❖



Choosing and Using Web Sites for Literacy Instruction: Evaluation Resources and Strategies

You're ready to incorporate the Web into your lessons, but how do you choose which sites to use?

by Emily Hacker

"If there's no meaning in it," said the King, "that saves a world of trouble, you know, as we needn't try to find any. And yet, I don't know," he went on, spreading out the verses on his knee, "I seem to see some meaning in them, after all."

Lewis Carroll,
Alice's Adventures in Wonderland

As of January, 2000, there were close to 10 million Internet web sites. If Internet use continues to increase at its current rate, almost 60 million US households will have Internet access by 2003 (Nielsen, 2000). That doesn't include the schools, libraries, and community-based organizations that increasingly provide public access to the Internet. The web is not a passing fad. In the United States, it has become a vehicle for information dissemination and commerce and a tool for communication, publishing, research, and activism. The ability to access information and people via the World Wide Web may also provide increased independence for learners in isolated areas or with special needs that prevent them from attending traditional classes. The national survey, *How States are Implementing Distance Education for Adult Learners,* found that "almost half the state directors of adult education perceive distance delivery as a means to help adult learners meet life demands, especially learners who are faced with work and family responsibilities, or who live in rural areas, and who cannot participate in traditional adult education programs" (NIFL, 2000).

Based on these findings, the Internet is a tool and resource that should not be omitted from adult literacy curricula. Having made this decision, however, the work of figuring out how exactly to use such a massive, eccentric, and, often unreliable resource begins. Ironically, one of the challenges to using the Internet is also one of the strengths of the medium — anyone can publish anything on it. As Nielson writes in *Designing Web Usability,* "Anybody can put up a site, and increasingly, anybody does. As a result, users don't quite know what to make of information retrieved from the Web. It can be the deep truth, or it can be the ramblings of a nut"(p.10). Trying to find a web site that matches your search criteria and has reliable, current information can make even the best researcher feel like Alice falling down the rabbit hole. Nielson describes the challenges of navigating such a vast information space as the Web as, ". . . probably so hard to solve that we will need all the help we can get, both from better software and from better-designed content" (p.92).

If Nielson, an Internet pioneer, considers successful web hunts to be a challenge for the "average" web consumer, imagine what he might say about the task of locating web resources that are accessible to adult literacy students and second-language learners. Fortunately, some literacy practitioners are working on three important aspects of this challenge. They are developing standards for the creation of accessible web resources for adult learners, creating new web and

multimedia products, and, lastly, creating a map so we can find these resources more quickly. See the box below for a description of this work.

For a web evaluation questionnaire I developed for *Surfing for Substance: A Professional Development Guide to Integrating the World Wide Web into Adult Literacy Instruction* (Hacker, 2000), I suggested that web sites can be broken down into four major components for the purpose of evaluation: authorship, design and navigation, content/information, and currency. Within each of these components are questions whose answers can help you ascertain who created the site, whether the graphic design of the site supports or distracts from the easy reading of the material on the site, and whether the information provided is accurate, current, and appropriate for your instructional goals. The questionnaire in its entirety is available online at http://hub1.worlded.org/teachers/surfing/websiteeval.htm.

"By now you probably realize that shortening your class preparation time is not among the strengths of the Web."

Other efforts to assist users in evaluating and designing web sites, while not all focused on the concerns of adult basic education teachers, can be helpful. Nielson provides criteria for effective web design that are also helpful for evaluating web sites. Nielson's first criteria (and, probably, yours also) is high-quality content. Standards for high-quality content will vary depending on your needs. In general, however, clues about the quality and accuracy of the content can be found when you determine the authorship of a web site. A site with no information about its author or its author's affiliations is equivalent to finding a flyer or pamphlet with no identifying information. You probably would not present it to your class as verifiable information.

Nielson also looks for sites that are easy to use, which generally refers to site navigation. When you are on the site, is it always clear where you are and how to get to other parts of the site? For adult literacy practitioners, ease of use includes other factors, as well. What is the reading level of the site content? Does the graphic design (i.e., font style, size and color, background, images) get in the way of the content or help to clarify it? Are there easy-to-

Mapping the Web

The Cyberstep project, funded by the US Department of Education, is developing standards for the development of web and multimedia instructional resources for adults functioning at low literacy levels. Based on these standards, the five Cyberstep partners will create new products for adult learners. By developing adult literacy-based standards for web and multimedia instructional design, Cyberstep will help the field as a whole to create new and improved online resources.

Cyberstep has already established several standards for the development of multimedia products for adult learners. It has published them in a working paper, "Standards for Creating Multimedia Learning Modules for Low Literacy and Limited English Proficient Adult Learners" (available at the Cyberstep web site http://www.cyberstep.org in PDF format).

A sample of four of the working Cyberstep standards (excerpted from the paper) will provide a sense of the project's direction. After reading the list, go to a web site that you frequently use for instructional purposes and see if it meets these criteria.

Multimedia learning material for adult learners should:

- Provide multiple ways to access and work with information, focusing on contextual learning
- Provide multiple methods to navigate within and between the learning materials
- Encourage learners to formulate, test and refine explicit hypotheses
- Engage learners in self-reflection and provide a way for learners to track their progress

If the Cyberstep project is successful and the partners not only develop their own products but also help practitioners and learners to become multimedia instructional designers, we need to make sure that a system is in place to help us easily locate these materials.

The National Institute for Literacy's LINCS project (http://www.nifl.gov/lincs/index.html) is focused on the challenging task of "mapping" the Web for adult literacy users. The goal of NIFL LINCS, as stated on its web site, is to "bring adult literacy-related resources and expertise to a single point of access for users throughout the world." To do this, LINCS maintains a searchable database of literacy-related materials, special collections of online resources on high-interest topics, juried lists of "hot" sites (web sites voted worthy of special mention), and several online discussion forums. The greater the number of mouse clicks it takes for someone to find a particular web resource, the less likely it is that she will ever get there. Therefore, an effort such as LINCS can play a critical role as an "Internet facilitator," helping to keep our search efforts focused, highlighting significant new resources, and providing opportunities for dialogue.❖

find help menus for first-time users of the site? Do you need to download a lot of plug-ins to access site content (a requirement that frustrates even veteran users)?

A third requirement in Nielson's criteria may be the easiest to overlook, but, when applied, can make a big difference in the quality of a learner's experience on the web. What about the site makes it unique to the online medium? In addition to current, accurate information, does it offer users opportunities such as joining topic-related online discussions, contacting "experts" by e-mail, engaging in interactive instructional activities and getting immediate feedback, linking to other related web resources, listening to audio files, or viewing a video clip? These are just a few examples of ways that content on a web site can and should be much more than a digital copy of the printed page.

An issue Nielson does not address, but that is becoming increasingly important in the world of web design, is whether a site is accessible to users with disabilities. Many of the guidelines for accessible web design also make sites more accessible for adult beginning readers. For example, an accessible web site uses a larger font size and high-contrast colors. It provides graphic and auditory alternatives for text and has a simple and consistent design and method of navigation (W3C, 1999). To determine if a site is accessible, you can use "Bobby," a web-based tool developed by the Center for Applied Special Technology (CAST, http://www.cast.org) that analyzes web pages for accessibility. Additional resources on web accessibility can be found at the Web Accessibility Initiative (http://www.w3.org/WAI/) and at GENASYS (Generating Assistive Technology Systematically; http://www.usm.maine.edu/genasys/index).

By now you probably realize that shortening your class preparation time is not among the strengths of the Web. I saw an advertisement recently for one of the many new education dot-coms. Its slogan is "point, click, learn." A more realistic picture of a teacher using the Internet is "point, click, evaluate, moan — *the reading level on this site is too high,"* or "point, click, evaluate, sigh — *this site has too many distracting graphics,"* or "point, click, evaluate, bang head on monitor — *this one requires a plug-in,"* until finally, "point, click, evaluate, cheer — *this site is just right!"* I believe, however, that the rewards of using the Internet in literacy instruction will compensate for the time and effort you put into finding worthwhile web sites.

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Professional Development and Technology

NCSALL and the Educational Resources Information Center on Adult, Career, and Vocational Education (ERIC/ACVE), are working to help build linkages between the adult basic education system and career and vocational education programs. To this end, we will be publishing occasional articles in* Focus on Basics *by career and vocational education professionals. We begin this series with a discussion with Ron Stammen, Director of the North Dakota Teacher Support Center and a professor of educational leadership at the School of Education, College of Human Development and Education, North Dakota State University. Ron has been involved for more than 20 years in training teachers to use technology in their vocational education programs. We spoke to him about what it takes to help teachers use technology in their classes.

FOB: *What advice do you have for professional developers in planning for professional development in the area of technology?*

RS: Support after training is key to ensuring that knowledge and skills gained in training become an integral part of a teacher's practice. It's what I refer to as sustainability.

FOB: *What made you realize this was important?*

RS: During the early 1980s, I was teaching adults how to use a spreadsheet program. Computers were new to almost everyone involved and the participants became excited as the hands-on instruction progressed. They began brainstorming ways to use their new-found knowledge and skills at home or in their workplaces.

Their printouts documented that they met the measurable objectives of the course. At the end of the course, I urged them to call each other or me for support whenever they needed it. Some did; most didn't.

I found that, after the course ended, some of the participants used the spreadsheet program extensively. Others, who had been equally motivated and successful during the course, never put their new skills to work. Motivation during the training and the need to use the technology on the job weren't enough. Resources and time seemed to be barriers. I started thinking about this and eventually focused my work on countering the technical, structural, and attitudinal barriers that confront many people who are learning computer-based technology.

FOB: *How did you test out your ideas about these barriers?*

RS: I worked on implementing a statewide computer network for K-12 schools in North Dakota. One reason it was successful, I think, was because teachers in each school were designated as building representatives for the network. These folks provided immediate support to their colleagues.

Continuous professional development activities held regionally or on-site upon request were also important to its success. The evaluations found that participants were successful when they had a purpose for their technology, and when they were able to collaborate with trainers and peers on a continuing basis. The technology trainers were teachers first and technologists second. They constantly promoted the idea that you need a continuing lifeline. They were asked questions that were both technical and instructional.

A similar activity held over a wider geographical area gave similar results. Participants noted that collaboration and on-going training helped them to implement what they learned.

FOB: *What about institutional support? How should that be designed to ensure that teachers who are trained to use technology really do use it?*

RS: Make sure there is a leadership plan that enables leaders and followers to really understand the purpose [of the use of the technology]. They need to know what's in it for them. The purpose must be simple, and all involved must have ownership.

"Support after training is key..."

The difficult part is where the leadership should lie. For example, we used a system that had a representative for each group of 10 people in a [school] building. The representatives are the designated

leaders. Sometimes they're appointed, sometimes they're identified according to their interest, and more often the latter.

The reps have to be continually supported. The school principal should be one of the other 10 people [in a group] and must be supportive of the building representative. So the training needs to extend beyond the teachers to the organizational systems. In fact, the systems work has to precede the teacher training.

FOB: *Can you tell us a little more about this?*

RS: School principals—in adult education, program directors—have to be willing, for example, to buy the technology, not just train people on it. In a lot of situations, people get trained, but there isn't enough equipment to go around. Five teachers can't use one overhead projector, for example.

All the details that go into implementation must be considered, as well: equipment purchase, ongoing training, time for planning, ongoing costs. If the principal is one of the trainees, you're more likely to see support for teachers. In all this, planning and development are done first with the administrators.

FOB: *How do you know if the use of technology is a success?*

RS: The core question is: How do we really know that this is making people learn better? We had an example of a teacher who really delved into learning how to take technology and make it flash on the wall. He used all sorts of good communications techniques but found that students were bored. He had created something that left the students passive, only passive in a different way. You have to ask why? Why are you using technology? If it serves the purpose, use it. If a good discussion serves the purpose better, stick with that.

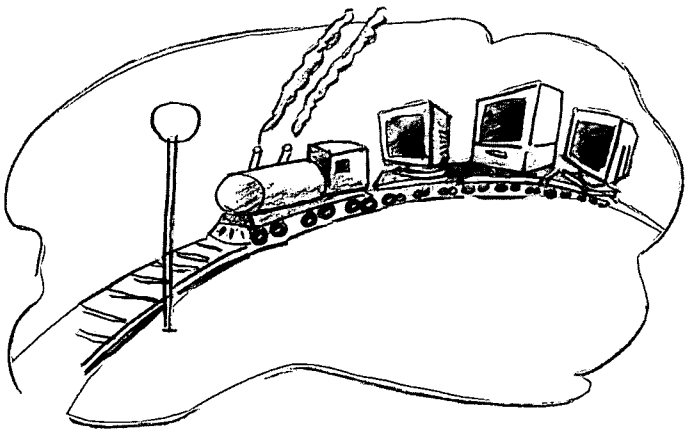
Solving Problems with Computer-Assisted Instruction at the East Texas Literacy Council

Computer-assisted instruction helped solve scheduling problems and build community among learners and volunteers

by Kelley Snowden

The East Texas Literacy Council was established in 1987 in Longview, in the heart of east Texas. An affiliate of both Literacy Volunteers of America and Laubach Literacy Action, we cover Gregg County, which includes the city of Longview and surrounding rural communities. In 1999, together with 158 community volunteers, we served 554 adult learners. Over the years, as our student numbers grew dramatically, we had become frustrated by how long it took to match a tutor with a student: almost three months. The students were even more frustrated and began to drop out. We were also concerned about the intensity of instruction our students were receiving. For some, two hours a week was all that their stressful, busy schedules would allow. But many others wanted more instructional time. We felt that both concerns could be addressed by the development of a computer-assisted learning center. They could.

Computer-assisted instruction has been an integral part of our services since 1992. Using computer-assisted instruction, students may begin their program of study immediately without having to wait for an available tutor or class, and may significantly increase their hours of instructional time each month. Now, working with a tutor, in the learning center, and attending classes, students may log upwards of 20 hours of instructional time a month.



We offer two programs: basic literacy and English for speakers of other languages (ESOL). In the basic literacy program, we match students one-on-one with trained volunteers to help them learn to read. In the ESOL program, we offer English classes in a family literacy format. Once students transition out of either the literacy or ESOL program, they may study for the tests of General Educational Development (GED) working one-on-one with staff or a tutor in pre-GED and GED materials. In addition,

we offer workplace literacy classes for both basic literacy and ESOL students. These classes are held at our office or at the workplace, depending on the needs of students and their employers.

When potential students come to us we first help them identify their educational goals. Based on their goals, we determine which program (basic literacy or ESOL) will be most appropriate. Once placed in programs, we work with them to create individualized learning plans designed specifically to address their immediate educational needs and help them meet their long-term goals. While each student's learning plan is unique in content, all learning plans include computer-assisted instruction in combination with classes or one-on-one tutoring.

All students enrolled at the Council have the opportunity to work on assignments in a 10-station networked computer learning center. Literacy students use educational software packages designed to help them improve their basic skills. We are in the process of upgrading our networked, basic literacy software. ESOL students use *The Rosetta Stone,* a program published by Fairfield Technologies. We found this program to be affordable, flexible to student levels, and enjoyable to use. A variety of other educational software is available in the learning center including math games, vocabulary builders, and even a typing tutor. In addition, we have an independent, single-user workstation where a student may study for his or her GED examination, independently or in conjunction with staff or a tutor, using the *Pre-GED 2001* and *GED 2001* educational software published by Steck-Vaughn. The learning center and GED workstation are open and available to students during our regular office hours and two nights a week. Currently the learning center, including the GED workstation, averages 600 hours of use per month, with an average of seven students in the lab at any one time.

Off-Site Option

Students need not come to our office to use computer-assisted instruction; however we have taken the technology to the students. In the ESOL program, some students attend English classes offsite at locations throughout Gregg County. In addition to ESOL classes for adults, childcare and children's activities for children ages three to 11 are offered at all sites. In these programs, adult students and their children can study in a portable learning center equipped with eight lap top computers. While adults are in class, children use the computers. We have taken these labs and classes to churches and schools that our clients or their children are already attending. This allows us to introduce the computer to those most likely not to have a computer in their home or to use one in the workplace.

> *"...we have taken the technology to the students."*

Other Benefits

Integrating computer-assisted instruction into our program has helped us expand the instructional services we can offer our students, speed up our learner–tutor matching process, and increase the instructional hours we offer. In addition to program benefits, we believe that the use of computer-assisted instruction has other direct benefits to students, staff, and volunteers. Students working in the learning center set their own schedules, making it possible for them to balance work and school more easily. Many of our students, especially ESOL students, have work schedules that change from week to week. This makes it difficult for them to attend a class consistently. However, because the learning center is available both days and evenings, these students are able to find times to study.

For many students, the classroom is a particularly difficult environment. Some students may not understand the social norms of American adult basic education classrooms. Others do not want anyone to know that they cannot read or speak English. Working in the learning center gives these students a chance to develop their skills independently, without the additional pressures of the classroom or potential for embarrassment.

This was certainly the case with Petra, who is in her 60s and recently immigrated to the United States from Colombia. She attended school there for three years as a child and spoke no English when she first came to us. After talking with her, we placed Petra in the learning center and a bilingual English class specifically for students who are recent immigrants and speak *no* English. We believed she would be comfortable in this class, where she could immediately meet other people with similar backgrounds. Far from seeing the class as an opportunity, however, Petra was too embarrassed to attend, afraid that the other students would laugh at her for being "so old" and not knowing any English. Therefore, to prepare herself to attend this class, Petra came to the learning center in the evenings and worked on improving her English using *The Rosetta Stone.* As a result of her hard work, Petra has now moved from level 0 to level 1 on the Basic English

Skills Test (BEST), an ESOL evaluation tool that includes an oral interview and a reading and writing section. She is looking forward to joining a class in September.

Peer Interaction

Working in the learning center gives students the chance to meet and work with other students. We have observed that as a result of this interaction, students become more cohesive as a group. For example, our ESOL learners are from many different countries. These students cannot communicate with each other in their native languages, so they must speak English to communicate with each other at all. Recently we had a trio of students who consistently studied together in the computer learning center. One student was from Mexico, one from Israel, and one from Iran. They arrived at the Council at the same time every morning and ate lunch together at noon. They were fascinated by each other's cultures and made great strides in their English through the process of getting to know each other. This dynamic was a new one to our program; one might say that they created an impromptu student support group. This would have never happened if we had offered only one-to-one tutoring.

Computer Skills

As students study in the learning center, they learn to manipulate the computer operating system and a variety of different types of software, which helps them acquire computer literacy skills as well as increases their self-confidence. We serve a wide variety of clientele, including some severely developmentally disabled students who are referred to us through state agencies. These students have never used a computer, and some initially do not even have the coordination necessary to operate the mouse.

Harry is in his 50s and lives in a supervised group home. He has poor coordination, and the medication he takes causes his hands to shake so severely that he is unable to hold a pencil. When Harry first came to us, he was withdrawn and quiet. He was fascinated, however, by the computers, and liked to watch other students use them. When asked if he would like to learn to use the computers, he said he was "too stupid" to learn. Based on that comment alone, we were determined to help Harry learn to operate the computers. It was a slow journey but, with time, Harry has learned to operate the mouse and navigate through various software programs. He has even learned to type (albeit very slowly) and is now able to write short notes on the computer. Harry now loves coming to the learning center, and especially enjoys announcing to staff and volunteers what he would like to work on that day and later showing off his completed work.

"Volunteering in the learning center gives the new volunteer the opportunity to become immediately involved in our program without any delay following training."

Benefits to Staff

When students enroll at the Council they are immediately assigned to the learning center as part of their individualized learning plan, prior to being matched with a tutor or placed in a class. This affords several benefits, giving staff the opportunity to

- Locate suitable tutors or classes for students without delaying their program of study
- Observe students' work habits and commitment to their individual educational programs
- Work with students individually and intensively, making it possible to assess further the students' strengths and abilities in an informal setting.

Once students have been matched with tutors or placed in classes, they are expected to continue their attendance in the learning center. This allows staff to maintain personal relationships with students and easily monitor their progress.

Expanded and Immediate

Another benefit to the program is instant gratification for the tutor. Following tutor training, while volunteers are waiting to be matched with students, they are encouraged to assist in the learning center. Learning center volunteers are given a software operations manual and are trained by either the literacy or ESOL program coordinator on a one-to-one basis. Volunteering in the learning center gives the new volunteer the opportunity to become immediately involved in our program without any delay following training. It gives volunteers not necessarily interested in tutoring or teaching a class the chance to work regularly with students without a long-term commitment. In addition, learning center volunteers have the opportunity to help both ESOL and literacy students, making it possible

for them to get to know many students. Over time, as relationships develop, volunteers and students may "self-match" and a one-on-one tutoring relationship or even a small group may form. This is not necessarily a goal for either volunteers or students working in the learning center, but these "self-matches" evolve out of established working relationships, making it more likely for the match to succeed in the long term.

"We now try to avoid these well meaning in-kind contributions and purchase new equipment whenever possible."

For example, Mike is a tutor in his 60s who has been volunteering with us for a number of years. He has had several successful student matches, but recently decided to volunteer in the learning center to accommodate his schedule. While volunteering in the learning center he met Ross, a student also in his 60s. These two found they had a lot in common and enjoyed meeting to talk. Mike enjoyed working with a student closer to his age, and Ross likewise enjoyed working with someone to whom he could easily relate. They now meet on a regular basis to work together: the self-made match has been successful.

Challenges

While computer-assisted instructional technology has its benefits, we have also discovered that certain challenges are involved, such as the cost of purchasing and updating equipment and software. It has taken us many years to create our learning center because the technology and its upkeep are so expensive. We saved money for three years before we could purchase our first two computers. Later we bought additional equipment with funding from community development block grants and the Junior League of Longview. Only in the past two years have we been able to purchase the equipment for our portable learning center, with funds from the GTE Corporation and the Junior League of Longview. To offset the cost of buying new equipment in the past we have accepted donations of used computers. However, in most cases we have not been able to load our software onto these older computers. We now try to avoid these well meaning in-kind contributions and purchase new equipment whenever possible.

We have also found that, because technology changes so quickly, it seems that as soon as we have it installed it is obsolete. Over the years we have had to learn to invest wisely in equipment and software, knowing it would be some time before we would be able to update. Our learning center is now almost 10 years old and we are currently seeking funding to replace our old equipment and software.

While integrating technology into our programs and services has come with certain challenges, we feel that it has helped us strengthen our program overall and made it possible for us to meet the needs of our students, volunteers, and community better. The use of technology has made it possible for us to expand our range of services and opportunities within the community, particularly with the availability of our portable learning center.

About the Author

Kelley Snowden has 12 years of university teaching experience. She was the ESOL Program Coordinator for the East Texas Literacy Council for the past two years. ❖

Focus on Basics Electronic Discussion List

Focus on Basics electronic discussion list is a forum for discussion about the articles published in *Focus on Basics*. It is a place to converse with colleagues about the themes examined in the publication; to get questions answered and to pose them; to critique issues raised in the publication; and to share relevant experiences and resources.

To participate in the *Focus on Basics* discussion list (it's free!), go to the LINCS homepage at http://nifl.gov. Choose "Discussions." Scroll down to and click on "*Focus on Basics*." Then click on "Subscribe," which is to the left, and follow the instructions. Or, send an e-mail message to LISTPROC@LITERACY.NIFL.GOV with the following request in the body of the message: SUBSCRIBE NIFL–FOBasics firstname lastname
Spell your first and last names exactly as you would like them to appear. For example, Sue Smith would type: subscribe NIFL–FOBasics Sue Smith

There should be no other text in the message. Give it a couple of minutes to respond. You should receive a return mail message welcoming you to NIFL–FOBasics.

The manager of this list is Barbara Garner, editor of *Focus on Basics*. She can be reached at Barbara_Garner@WorldEd.org. Please DO NOT send subscription requests to this address. ❖

Editorial Board

Volume 4, Issue C: December 2000

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Wil Hawk, National Institute for Literacy, Washington, DC

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Sharon Ultsch, Old Orchard Beach/Saco Adult Education, Old Orchard Beach, ME

Technology-Based Projects and Resources for Adult Basic Education

by Janet C. Smith

A wider variety of technology-based projects and resources are available for teachers and adult learners in adult basic education (ABE), English for speakers of other languages (ESOL), and preparation for tests of General Educational Development (GED) than ever before. Adult learners continue to benefit as technology is increasingly incorporated into teaching and learning at all levels. The technology in these projects can be used as part of the curriculum, as the delivery mechanism for the curriculum, as a complement to the curriculum, or as an instructional tool.

This brief article presents some selected projects and resources that can be useful to learners, teachers, and administrators alike. It is not a comprehensive listing, given the vast number of projects/resources that exist today. The selection priorities for the first table included presence on the Internet, broad scope, some level of interactivity, ease of use, and reasonable cost (if not free). The second table includes video, CD-ROM, and print series combinations that are not currently available over the Internet, but widely in use and highly regarded. Some of these plan to have Internet accessibility shortly.

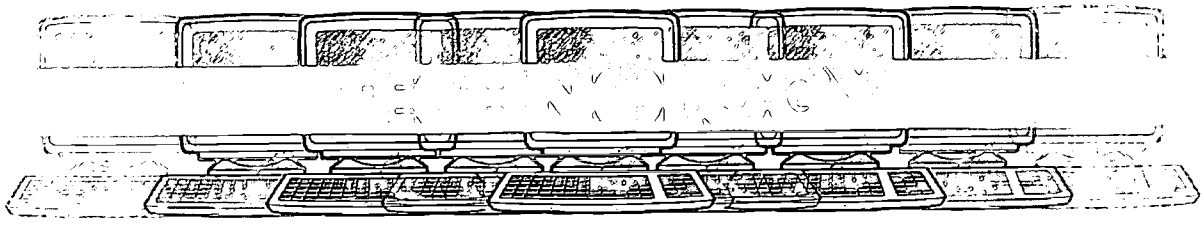
WEB-BASED PROJECTS AND RESOURCES

AUDIENCE	PROJECT	DESCRIPTION	WEB SITE
Learners & Teachers (ESOL, GED)	**Learning Resources,** CNN San Francisco	This **web site** offers students an opportunity to read and react to news stories, both past and present. It includes a searchable index of articles, each available in three levels of text (outline, edited, full). In addition, several are supported with multimedia extensions; for example, each story is also available in audio and video format. Each article is followed by six short-answer activities that provide immediate evaluative feedback. There is also an opportunity to respond to materials via e-mail. A brief teacher's page describes the objectives, lessons, and materials.	http://literacynet.org/cnnsf
Learners & Teachers (ESOL)	**Dave's ESL Cafe**	This comprehensive **web site** includes numerous interactive elements for teachers and learners such as chats, electronic discussion lists, idea exchanges, discussion forums, job information, quizzes, and more.	http://www.eslcafe.com
Learners & Teachers (ESOL)	**Randall's ESL Cyber Listening Lab**	This **web site** focuses on listening skills, a relatively underdeveloped area on the Internet. It offers audio exercises at varying levels of difficulty, which are coupled with quiz-type activities. It provides learners with a way to improve listening skills outside of the classroom.	http://www.esl-lab.com

continued . . .

WEB-BASED PROJECTS AND RESOURCES

AUDIENCE	PROJECT	DESCRIPTION	WEB SITE
Learners & Teachers (ASE)	**Mindquest**	This **online program** is designed for adults and young adults who want to complete a regular high school diploma, issued by a public high school. It includes customized courses developed for online education, interactive teaching and learning with strong teacher support, and portfolio-based learning and assessment. Free to Minnesota residents, available to others for a fee.	http://www.mindquest.org
Learners & Teachers (ABE)	**Cyberstep**	This **project** is developing standards for the development of web and multimedia instructional resources for adults functioning at low literacy levels. Based on these standards, the five Cyberstep partners will create new products for adult learners. will provide **multimedia instructional materials** targeted to adults functioning at low literacy levels. See box on page 26 for more information.	http://www.cyberstep.org/public/cyberstep.htm
Learners, Teachers, Administrators (ABE, ESOL, workplace, and general literacy for all)	**LINCS (Literacy Information and Communication System)**	This **web site** features multimedia curricula developed by practitioners, special collections on major literacy topics, the latest literacy-related research and statistics, opportunities for communicating with colleagues directly and through online discussion groups, and peer-reviewed sites.	http://www.nifl.gov/lincs/index.html.
Learners (GED, Workplace), **Teachers & Administrators** (Professional Development)	**PBSLiteracyLink** (PBS Adult Learning Service, NCAL, Kentucky Educational Television, and the Kentucky Department of Education)	**Online literacy instruction and staff development system** incorporating online technologies (through the Internet), video technologies (digital, closed-circuit, broadcast, and satellite), and computer technologies (including digitized audio and video, computer-generated graphics, interactive multimedia, and text).	http://www.pbs.org/literacy
Teachers & Adminstrators (Professional Development)	**Online master's degree program in Adult Education,** Penn State World Campus	33-credit **online master's degree in adult education**. Each course is taught using a blend of Web technology, print, and other media to provide an effective balance of flexibility and interaction.	http://www.worldcampus.psu.edu/pub/adm/facts/adted_facts.shtml



ERIC

VIDEO, CD-ROM, AND PRINT SERIES-BASED PROJECTS/RESOURCES

AUDIENCE	PROJECT	DESCRIPTION	WEB SITE
Learners & Teachers (pre-GED)	**ALMA (Adult Literacy Media Alliance)** and **TV411**	This is a series of **literacy videos, and accompanying print materials** designed for use by individuals in their homes, in literacy classes, as well as in community settings such as libraries, health clinics, employment centers, churches, and banks in urban and rural regions throughout the country. The Starter kit includes 13 TV411 video cassettes and 10 print packages, each containing 13 TV411 Workbooks and one User's Guide. (Internet component planned.)	http://www.tv411.org/alma.html
Learners & Teachers (ESOL)	**Connect With English**	This **video and print series** is designed as a complete ESOL course in secondary, adult education, college, corporate, and community organizations, as a supplemental classroom resource for school, business, and community organizations, or as a self-study course for ESOL students at home or at work.	http://mhhe.com/socscience/esl
Learners & Teachers (high-level ESOL, citizenship courses)	**On Common Ground, PBS**	**Video and print series** to be used as an introductory course in civics and government; a resource for civics, government, history, contemporary studies, political science and citizenship courses; and a resource in courses with ESOL learners. Uses situations that would take place in a typical American city as citizens deal with everyday life. Includes 15 half-hour programs, print worktexts, and teacher's resource books.	http://www.Intelecom.org/courseinfo.asp?id=20
Learners, Teachers, & Administrators (ESOL/ESOL, adult and family literacy, basic skills [pre-GED], workplace/vocational ESOL, correctional education programs)	**Crossroads Cafe**	This **video and print series** tells the story of an ethnically, culturally, and linguistically diverse group of people who work at and patronize a café. It includes instructional segments on culture and language, workbooks and photostories for learners, transcripts and resource books for teachers, assessment packages, and a partner guide with activities for native speaker friends, relatives, or tutors.	http://www.Intelecom.org/courseinfo.asp?id=10&submit1=GO http://ecatalog.thomsonlearning.com/125/
Teachers & Administrators (Professional Development)	**Captured Wisdom:** Stories of Integrating Technology into Adult Literacy Instruction	This is a series of **multimedia CD-ROMs** on best practices of integrating technology into ABE/GED/ESOL instruction. The videos of actual classes are complemented by questions raised by adult education practitioners and answered by the cooperating teachers, ensuring that the resource will address the concerns that teachers may have about using technology with adult learners.	http://www.ncrel.org/cw/al/

BLACKBOARD

Articles on Technology Previously Published in *Focus on Basics*

Technology Melts Classroom Walls
Susan K. Cowles
(Volume 1, Issue C, September 1997)

Hooked on Learning: The Internet Poetry Project
Linda Parrish
(Volume 1, Issue D, December 1997)

Using Software Applications to Teach Math
Catherine Cantrell
(Volume 4, Issue B, September 2000)

Resources on Searching the Web

Learning More about Search Engines and Subject Directories FAQs
www.cln.org/searching_faqs.html

The Search Is Over
www1.zdnet.com/pccomp/features/fea1096/sub2.html

Finding it On-line: Web Search Strategies
Home.sprintmail.com/~debflanagan/main.html

ESOL and Technology Integration Resources

CALL Lab Resource
http://www.netword.com/esl_home

CESOL (Computers and English for Speakers of Other Languages)
http://hub1.worlded.org/docs/cesol/cesol.htm

Computers in Action: Integrating Technology with the ESOL / ESL Curriculum
http://hub1.worlded.org/doc/cia/index.htm

ESL Cafe Discussion Forum on CALL
http://eslcafe.com/discussion/dt

Harnessing Technology to Serve Adult Literacy
http://www.alri.org/integratech.html

Integrating Computer Skills into Low Level ESL
http://www.cdlr.tamu.edu/tcall/newsletr/dec98a.htm#integrate

Integrating Technology into the Literacy Classroom
http://www.libertynet.org/mcol/paltip.html

Potpourri

Keystrokes to Literacy: Using the Computer as a Learning Tool for Adult Beginning Readers
by Antonia Stone
http://www.amazon.com/exec/obidos/ASIN/0844206792/search0a/103-5954087-4968613

Web-based Education Commission
http://www.hpcnet.org/cgibin/global/a_bus_card.cgi?SiteID=154797

And my favorite site:
http://hub1.worlded.org/lincs/whatsnew.htm

NCSALL Web Site

Visit our web site for all issues of *Focus on Basics*.
http://gseweb.harvard.edu/~ncsall

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The Working Conditions of Adult Literacy Teachers: Preliminary Findings from the NCSALL Staff Development Study

by Cristine Smith, Judy Hofer, & Marilyn Gillespie

What factors in adult basic education (ABE) teachers' work environments impede or enhance their abilities to do the best job possible? Although not the primary focus of our research, this question leapt to the foreground of the National Center for the Study of Adult Learning and Literacy's (NCSALL) Staff Development Study, which is examining outcomes for teachers of participating in staff development. We realized that we cannot hope to understand such outcomes if we do not first have a keen understanding of the realities of teachers' working lives.

Continued on page 3

Focus on Basics is the quarterly publication of the National Center for the Study of Adult Learning and Literacy. It presents best practices, current research on adult learning and literacy, and how research is used by adult basic education teachers, counselors, program administrators, and policymakers. *Focus on Basics* is dedicated to connecting research with practice, to connecting teachers with research and researchers with the reality of the classroom, and by doing so, making adult basic education research more relevant to the field.

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NCSALL
National Center for the Study of Adult Learning and Literacy

WORLD EDUCATION

Welcome to *Focus on Basics*

Dear Readers,

Exposing myths and confirming folk wisdom are opposite endeavors, yet that is what research is all about. In this issue, we do both. Our cover story, by National Center for the Study of Adult Learning and Literacy (NCSALL) research team Cristine Smith, Judy Hofer, and Marilyn Gillespie, confirms what program-level staff in adult basic education (ABE) already know. Working conditions in ABE act against anyone's ability to improve quality. The result is that teachers challenge the conditions, cope with them, or quit. Bruce Wilson and Dickson Corbett, evaluators working with NCSALL, found much the same. ABE practitioners have little access to professional development, they write in the article that starts on page 25. We must make a commitment to the challenge of improving working conditions if we want to reach the ultimate goal of benefiting adult learners.

Improving working conditions is one step necessary to increase the effectiveness of ABE; using research-based information is another. What ensures the use of research? How does NCSALL ensure that its research is used? These questions form the basis for the article that starts on page 8. *Focus on Basics* plays a large part in the dissemination of findings, but interactive dissemination efforts are even more important. If you can not join a study circle, go to a workshop, or participate in a research project, join in discussions with researchers about their work via the *Focus on Basics* electronic discussion list. See page 31 for information on how to subscribe.

The NCSALL Longitudinal Study of Adult Learning (LSAL) is helping to expose some myths of adult education. As Steve Reder and Clare Strawn report in the multi-part articles on pages 13-18, ABE students may conceive of their serial enrollments in programs as part of a long-term approach to educating themselves, rather than a series of failures. How do our attendance-calculating policies match, or contradict, the perspectives of our students? Data from the LSALs also encourage us to rethink our conception of adult learners as "school resisters," point out Reder and Strawn. Many students may have enjoyed, or at least not minded, school. What does that mean for program design and instruction? Additional findings from the LSALs will be available later in the year. In the meantime, give us your reactions to these.

The NCSALL study on the Literacy Practices of Adult Learners (LPALs) has also confirmed what many teachers know: by using authentic reading materials in class, we increase our learners' out-of-class literacy activities. Read more about these findings in the article starting on page 19. We've included some examples of promising class practices to provide you with ideas on how to implement these findings.

To help you locate other research that might be of use in making decisions around program design and instruction, Jessica Mortensen has started compiling a list of current research activities in ABE. If your research project was not included, please contact Jessica at jessica_mortensen@worlded.org and provide her with the details. We will add the information to the list on our website, http://ncsall.gse.harvard.edu.

In addition to doing research, NCSALL runs a literacy class and publishes, with Jossey-Bass, Inc., the *Annual Review of Adult Literacy and Learning. Volume Two* is now available. Check our website for particulars, or call Jossey-Bass at 1-800-956-7739.

Sincerely,

Barbara Garner

Barbara Garner
Editor

Conditions ... *continued from page 1*

This article describes the environmental factors that seem to influence teachers' abilities to do their jobs well. Factors include the physical facilities where teachers work, the amount of time and support they have to do their jobs, and the training or development opportunities they have. Although these conditions exist within teachers' programs, they are greatly influenced by the policies and practices of the local, state, and national ABE and staff development systems in which these programs operate. Our preliminary findings are based on data from questionnaires completed by more than 95 teachers who participated in our study, as well as in-depth interviews with 18 teachers and their program directors. The data so far indicate that at least five categories of factors influence teachers' ability to do their jobs well in adult basic education: **1. Access to resources** that affect how teachers do their jobs, including classroom and program facilities and access to materials and technology; **2. Access to professional development and information,** including access to written and electronic material that helps them better understand their classrooms, their programs and their field; **3. Access to colleagues and program directors,** allowing teachers to meet with, talk to, and get feedback from those within their program, their state, and in the larger field of adult basic education; **4. Access to decision making** that allows teachers to participate in helping to improve the quality of services that learners receive, particularly through program policies and practices; and **5. Access to a "real" job,** including sufficient working hours to complete all of the teaching, program, and other tasks required of teachers; paid preparation and professional development time; stability; and benefits.

While we frame these factors as problems of "access," they are, in some instances, not just a function of access but a sign that such resources do not even exist. We discuss here each of these broad categories, their effects on teachers and programs, and their implications for adult learners and for the field as a whole.

Environmental Factors

Resources: *"I'd love it if we had our own place"*

"I don't teach in my own classroom . . . I'd love it if we had our own place, and I could set things up just so like a regular teacher, but I can't . . . I always carry such a big heavy bin that the other teachers make fun of me and call it my hazardous materials box . . . Anything that I use to teach I bring in and I have to leave that classroom exactly the way it was when I leave."

—ESOL teacher

"Lack of physical space is often a problem. Classes are sometimes held in hallways and lunchrooms."

—GED teacher

Although some teachers were provided with good facilities in which to work, more often conditions were unsatisfactory. Teachers worked in borrowed space: in classes occupied during the day by K-12 teachers, in school cafeterias, or in the back rooms of offices. Often they could not use the blackboard, move chairs, display student work, or store materials. The most extreme case was a teacher who taught in a storage closet used by the local police that had walkers and folding chairs hanging from the ceiling, with ventilation so poor that students with allergies were having difficulty breathing. The inability to leave materials in place from one class to the next constrained teachers' abilities to plan and implement lessons. The lack of textbooks, particularly books students could take home; equipment such as computers and overhead projectors; teaching supplies; and access to photocopy machines were other missing resources frequently mentioned.

Professional Development and Information: *I Want to Do It Better*

"I've had trouble teaching them . . . using methods that are different from

Out of 95 teachers in our study . . .

- 39% did not have their own classrooms or space to teach or post materials.
- 29% did not have their own desk or place to leave materials.
- 13% said that adequate heating and cooling were not available in their programs.
- 17% said that the classrooms and/or furniture were not adequate enough in size.
- 33% rated concern about program facilities as one of their top three concerns about working in the field of ABE.
- 20% of the teachers did not have access to a computer in their programs.
- 31% did not have access to the Internet.
- 65% stated that there was no teachers' room in their program where they could meet informally with colleagues.
- 38% of teachers do not have a resource center inside their programs.
- 52% had no place for students to meet outside of class.
- 23% received no paid professional development time.
- 32% received only one to 12 hours a year of paid professional development time.

the way I learned in school and that's been a problem because I don't really want to teach them entirely the way I learned in school. I want to do it better."

—ABE/GED teacher

There is a wide range in amount of access to knowledge and information about the field and about teaching and learning in adult education. Although the majority of the teachers in our study had taught in the K-12 system, 57% had not taken a single undergraduate or graduate course related to teaching adults. In light of their lack of prior preparation, it would seem that professional development on the job would be of paramount importance. Yet support to attend workshops, other training activities, and participation in conferences was notably lacking.

Even without support, however, most practitioners do participate in professional development. Workshops were the most common type of professional development (2.8 attended per year), and then conferences (1.4 per year). Most teachers went to single-session workshops and perhaps attended one state adult education conference in a given year.

Some teachers received little or no information about what was happening in adult education in their state. In fact, some of those who attended our staff development were surprised to learn that a "field" of adult education existed at all. They were unaware of journals in the field, of resources on adult education available through the Internet, or of the existence of national organizations for adult educators. One new teacher described her orientation this way:

When I was interviewed, I was hired on the spot. I was brought upstairs to the room I would be teaching in and I was shown this big cabinet. They opened up the cabinet and they said, "Here are the materials." That's it. That was my orientation.

—ESOL teacher

For other teachers, however, the picture was quite different. They regularly received newsletters describing upcoming training opportunities and summarizing new materials available at their regional resource centers. They could choose from activities such as multisession workshops, teacher mentoring opportunities, curriculum development committee work through which they could provide input into state content standards, participatory research activities, and collaborative Internet-based projects.

In the previous year...

- 23% of teachers in the study attended no workshops.
- 21% attended no conference.
- 65% did not participate in peer coaching.
- 79% had participated in no practitioner research.
- 47% had not engaged in curriculum development projects.
- 65% had not participated in a study circle.
- 52% read adult literacy-related materials less than 20 hours a year.
- 59% did not participate on any adult literacy electronic discussion lists.

Colleagues and Program Directors: *Isolation Gets in the Way*

Isolation is difficult and gets in the way of me learning. I need to be stimulated and I need the ideas of other people. I would give anything . . . for us to be together and share.

—ESOL teacher

Teachers wished they had access to more training outside their programs. They felt even more keenly the desire to be part of a learning community inside their program: to observe other teachers in action, to have regular staff meetings where they could share ideas with colleagues and, in some cases, to be mentored by a more experienced teacher or supervisor. The majority of programs (71%) have monthly staff meetings but teacher sharing meetings (where teachers meet to talk about teaching rather than administrative issues) were far less common. Half of all teachers in the sample reported that their programs have such meetings fewer than four times a year, and 10% of teachers reported that they never had such meetings. The only contact with colleagues for many teachers consisted of quick conversations in the school parking lot or hallway:

Everybody is part-time. Since we don't regularly meet, where do you picture these informal conversations taking place? If we pass each other in the hallway, we might have a five-minute conversation . . . It's not like we have a lounge where we all gather because if we're not physically teaching, we're not usually physically present. It's not the same as in public education where you might have 40 minutes in the day when you're not busy . . . that doesn't happen when nobody is full-time.

—GED teacher

Moreover, most of the 18 teachers in our subsample reported that their directors rarely, if ever, visited their classrooms. While their directors often saw their "hands off" approach as an expression of confidence in their teaching, teachers — particularly new teachers — often wished for more teaching-related supervision and structured feedback.

Only a few teachers described themselves as working in collaborative teaching environments. In these sites, program directors were frequently former teachers. Teachers met regularly to reflect, plan, and solve problems. An ethic of collaboration encouraged more experienced teachers

to support newer colleagues — in one case allowing newer teachers to "eavesdrop" on other classes. "If I hear a group really excited by something, I might wander over . . . I'm afforded that opportunity," observed one new ABE teacher.

Decision-Making: *I Haven't Been Heard*

I haven't been heard, no, I have not been heard. It makes me feel that I am sort of an outsider, I guess. I'm pretty powerless.

—*ESOL teacher*

The extent to which teachers have formal opportunities to learn about, discuss, and influence aspects of their program varied greatly, but they are clearly interested in program structure and mission: 41% rated it as one of their top three concerns about working in the field. The primary way in which teachers gave input to the program was to take the initiative to meet individually with the program director. Communication was sometimes so limited that, in one case, a teacher only learned that her program's funding had run out and that it was her last night of teaching because she happened to run into her director at one of the sites. The classroom, not the program, was the teachers' domain. Although teachers had to observe some external mandates such as testing requirements, many had relative freedom in deciding how to teach and the materials to use. However, support from program administration was cited as a top concern by 33% of the teachers in our sample.

We are the teachers. We teach the students . . . We don't have a right to say, 'OK, what if the budget goes this way?' . . . What makes a program is everyone concerned, not the one or two persons to make decision for others . . . Programs are going to have to start realizing how to keep their teachers. They want good teachers but yet they won't do anything to keep them.

—*ESOL teacher*

In many local education agencies (LEAs), directors themselves were constrained in their ability to implement change. Programmatic changes were often subject to the approval of the director of continuing education or the superintendent of schools. Program directors expressed frustration at the extent to which their ability to adjust the program to the needs of students was limited by school-wide policies, contributing to the feeling of teachers that their voices were not heard.

In direct contrast were programs where teachers met regularly and were expected to make decisions not just about "housekeeping" issues but about substantive issues such as program design and hiring new staff. Of the 18 teachers we interviewed, the five who worked in such programs were either part of community-based or family literacy programs. In these cases teachers felt the sense of ownership and understanding of the program as a whole:

I'm aware of all the parts of our program so I can communicate about other parts, if they [community members, prospective students] have a question for me.

—*Family literacy teacher*

"Real" Job: *A Real Job for People*

For us it was a major struggle to get full-time jobs and get health benefits . . . I think we had clear concerted efforts about the development of solid jobs — where this could be a real job for people.

—*Program director*

Adult basic education teachers, like other professionals, need jobs that offer a livable wage and benefits, as well as sufficient working hours to do their jobs well. This includes being paid not just an hourly wage for time in the classroom but also for the time required to prepare for classes, follow-up with students, contribute to program improvement, and learn about the job. For the teachers in our study, such jobs were the exception, not the rule.

Using a fairly liberal definition of "full time" (25+ hours per week) . . .

- Only 45 of 103 teachers were full-time, with the mean number of hours worked equaling 22.6 per week.
- Only 24 teachers worked 35 or more hours a week.
- Of 78 teachers who provided such information, 45% received benefits, and 54% received paid time for classroom preparation and planning-related activities.

Concern about salary ranked high (second out of 11 concerns). Even among teachers who did work full time, wages were often low. One full-time teacher explained that after eight years in the field, she still earns less than a beginning K-12 teacher.

If anything were to happen to my husband there is no way I could support a household... there's no way I could support myself on that wage. I'd have to go on food stamps.

—*Family literacy / ESOL teacher*

Often, it was taken for granted that dedicated teachers would give unpaid time outside of class to find ways to apply what they had learned in staff development to the classroom. The fact that women predominate in the profession, as this director points out, may contribute to this expectation:

I just don't see how you can expect people to commit to any kind of staff development and find out more about best practices when you pay them for four hours a week . . . I don't go for paying someone 40 hours a week and expecting them to work

Out of 104 original teachers in our sample . . .

13 (12.5%) had left the field one year later. Of this group, one could not be located, four had left the field for reasons unrelated to working conditions (relocation, attending graduate school), and two wanted to work in the K-12 system, but the reasons the others left were all related to working conditions (two cited the need for benefits, two cited the need for more pay, two cited the need for job stability).

80 or paying them for 20 and expecting them to work 40. I just don't believe in it and I think it's been done so much to women.

—Program director

In addition to low wages and poor working conditions, teachers perceived their status within the teaching profession as low:

There's a perception out there that we are not real teachers. We're not as credentialed or as good or as certified and that hurts our image.

—ESOL teacher

Impact on Students

The negative impact of these environmental factors on students — in particular, the lack of access to resources — was conveyed by several of the teachers in our subsample:

They [the students] came in the first day when they saw this [the classroom in the storage closet]. There's no mistaking about how the town feels about us when this is where we are and a minor department in town has got a newly painted office and this is where a school is.

—ESOL teacher

Having old computers is one example. Not having enough books is another. I think it's kind of lousy that a student can't take a book home.

—ESOL teacher

Responses to Conditions

The ways in which teachers chose to respond to these conditions varied. Our study suggests that teachers make one of three decisions when they are cognizant of working conditions that are less than optimal: they decide to *challenge, cope,* or *leave*. In our subsample of 18 teachers, we did identify teachers who were so isolated that they did not have a point of comparison for what good working conditions might look like and thus did not take any action. Others, however, were clear about the strategy they had chosen when faced with an environment that made it difficult for them to do their jobs as well as they wished to.

Challenge

In cases where teachers had a strong voice in decision-making within their program, challenging the program or system to improve was regarded positively. These teachers often saw themselves as part of a team made up of their colleagues, their director, and sometimes students themselves. Although their working conditions were not always optimal, they felt a sense of ownership of their programs and an investment in a process of program improvement.

For other teachers, the choice to try to challenge or change their working conditions would entail rocking the boat. When asked whether their programs choose at least one issue each year on which to work toward program-wide improvement, 39% of the teachers in our sample said "no," an indication that these teachers have no organized opportunity or mechanism to make change. When asked the extent to which their director encouraged them to have a voice in decisions within the program, teachers' mean rating was 5.09 (with "1" being *no encouragement at all* and "6" being *complete encouragement*). However, when asked the extent to which they felt their voice was actually used in decision-making, the rating was lower (a mean of 4.55).

As a teacher, we are always looking toward making sure that learners' needs are met. I can't do that if my needs are not met . . . No wonder learners are giving up. No wonder they're afraid to go talk to administrators when teachers are even afraid to follow up on their issues . . . If I'm going to teach students to voice their opinions and to make changes, I need to do it also.

—ESOL teacher

Cope

Teachers who have chosen to cope with unsatisfactory conditions have learned how to do their work while dealing with the frustration caused by their circumstances:

I've learned to roll with the punches. If you can't change it, accept it. Frustration would accomplish nothing.

—GED teacher

. . . teachers are already tired. They've had a rough year. Then to try to fight the administrators all the time. They give up . . .

—Family literacy teacher

For some teachers coping meant simply "putting in your 20 hours" and doing the same thing year after year; for others, it meant striving to improve their practice within the areas over which they had control, such as classroom activities. Since ABE has no existing national organizations within which ABE teachers can have their voices heard collectively, a teacher who feels she or he cannot challenge (or has unsuccessfully challenged) poor environmental conditions must either choose to cope or leave.

If we talk too much, then they're going to make it hard for us. It's this perception that you as an individual have no right to say or voice your opinion . . . There's nothing as far as ABE teachers or any type of support or like an organization or a union or anything. There's nobody there to support this individual, to say it's OK to voice your opinions . . . their fear of losing their position is a reality. It does happen.

—ESOL/family literacy teacher

Leave

When I started eight years ago, there was a core teacher group that we all hung out with, especially at conferences and stuff . . . Now it's like we see all new faces. I thought, 'Where'd they go? They were good, bright teachers, how come they left?'

—ESOL/family literacy teacher

Teachers have a third option: leave the field. While some teachers leave for reasons that have nothing to do with environmental factors (retirement, relocation), others do see leaving the field as a decision they need to make, either because they tried to make a difference and were unsuccessful or because they chose not to cope.

Right now ABE teachers throughout the state, and I'm sure it's true in other states, we're leaving because of the finances . . . This is why teachers are leaving; and that's why teachers that do come in, do not give their all to programs because of this. I see it and I hear it.

—Family literacy teacher

In teachers' perception, the high teacher turnover rate is an important reason why students leave:

When you lose a teacher in the middle, or even after a year, it's a huge issue. I'm sure we've lost some students who will never come back because their teacher is gone.

—ESOL teacher

Implications

Few would argue that the recruitment and retention of good teachers are key to improving adult basic education. System reform cannot succeed unless it focuses on creating the conditions in which teachers can teach well. Even though numerous teachers do wonderful jobs, our findings so far indicate that we need to pay more attention to what teachers have to say about their working conditions if we are to design and deliver effective staff development, improve student retention, and professionalize the field as a whole. It is hard to imagine how the field of adult learning and literacy will be able to provide the type of instructional services learners need when teachers — most of whom are part-time and do not receive benefits or salaries commensurate with their K-12 counterparts — are faced with working conditions and environmental factors that make it difficult for them to learn about and deliver quality instruction. A rigorous accountability system may only demonstrate the limited outcomes and impacts that result from such conditions.

About the Authors

Cristine Smith, a World Education staff member, is associate director of NCSALL and principal investigator for the Staff Development Study. She has more than 15 years experience in adult basic education as a teacher, teacher trainer, curriculum developer, and program designer.

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BLACK BOARD

continued from p. 32

education. The *Plan* also includes a literature review, input from experts and stakeholders, recommendations on dissemination, and a potential research-to-practice model. Call the NIFL hotline at 1-800-228-8813 for printed copies. An online version is available at www.nifl.gov.

Career and Technical Education

- The National Research and Dissemination Centers for Career and Technical Education, funded by the Office of Vocational and Adult Education, U. S. Department of Education, engage in activities designed to improve career and technical education. The Centers are operated by five primary partners: University of Illinois, University of Minnesota, The Ohio State University, Oregon State University, and The Pennsylvania State University. NCSALL is collaborating with the Information Synthesis Products project, operated by the National Dissemination Center, to disseminate information about career and technical education to adult educators. More information on the Centers and their programs can be accessed at http://ncte.com.

Corrections

- In Volume 4 C of *Focus on Basics,* we neglected to include the biography of *Janet C. Smith,* author of "Technology-Based Projects and Resources for Adult Basic Education." Janet is editor, web manager, and a project manager at National Center on Adult Literacy/International Literacy Institute, Graduate School of Education, University of Pennsylvania. She produces publications and is responsible for the LITERACY.org web site. Her most recent project was the International Literacy Explorer web site/CD-ROM.

Connecting Research and Practice

A look at what is known about research utilization and what NCSALL does in that regard

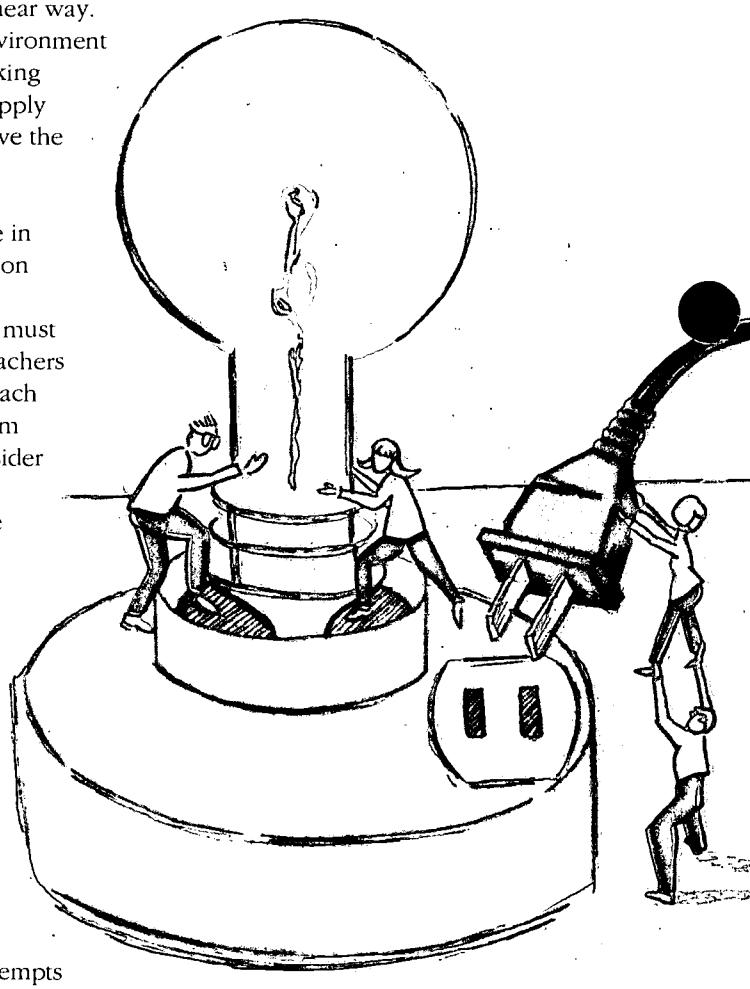
by Barbara Garner, Beth Bingman, John Comings, Karen Rowe, & Cristine Smith

"Is the role of research to provide information or to produce change?" writes K. Patricia Cross, a scholar known for her research on adult learning (p. 63). It is both. Research findings that are not shared with practitioners in ways that foster application are ineffective. Unfortunately, traditional models of research to practice assume that the transfer of knowledge can take as long as 50 years. First, scholars conduct the research, then they publish findings in academic journals, then the academic articles form the basis for similar research and at the same time make their way into the syllabi of preservice academic training for teachers, and slowly the knowledge makes its way into classroom practice.

Educational research has moved beyond that linear model. The relationship between researchers and practitioners is now recognized as important. Current models of research to practice show an interaction: researchers work with practitioners to develop research agendas; practitioners work with researchers in conducting research; researchers and practitioners engage together in deriving meaning from the research findings; and researchers and practitioners participate in the dissemination process. Sometimes an intermediary institution is involved, such as a lab school, to provide a place where new methods can be tested and refined before they are shared widely. In this model, researchers and practitioners are all working for educational improvement.

Teachers and policymakers do learn from research (Turnbull, 1992, p. 21), but not in a linear way. Teachers scan the environment for new ways of thinking and are most apt to apply those ways if they have the chance to "work on increasing their professional competence in settings of collaboration and mutual support" (ibid.). Collaboration must be close to home. Teachers seek approval from each other, particularly from colleagues they consider more experienced.

In this article, we provide a brief overview of the research on educational research dissemination and utilization. We then describe the ways in which the National Center for the Study of Adult Learning and Literacy (NCSALL) attempts to foster interaction between research and practice.

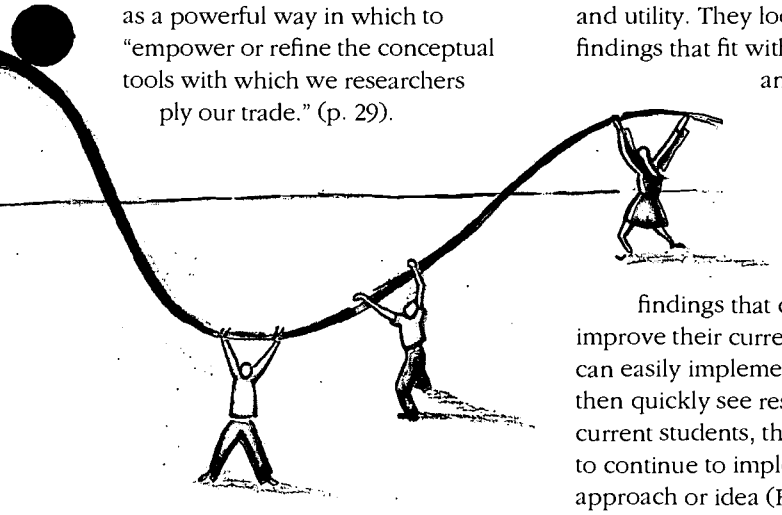


Sustained Interactivity

Collaboration between researchers and practitioners increases the chances that research findings will be translated into practice. Michael Huberman (1992) conducted a number of studies showing that "sustained interactivity" among researchers and practitioners is more likely to lead to research utilization than is limited interaction. In sustained interactivity, practitioners are seen as partners or actors rather than targets. An implicit assumption of sustained interactivity is that the meaning and validity of the study are negotiated by practitioner and researcher. Researchers and potential users of the information interact repeatedly at different points during the course of the research: not just after, but prior to and during. For example, a few practitioner representatives may serve on an advisory

board to a study, identifying which elements of the study are of most interest to practitioners. They may provide insight into how the findings challenge local norms, and help conceptualize the ways in which research results can best be conveyed to practitioners.

In his work on research utilization, Huberman (1985) explored the impact of sustained interactivity on the researchers. Not surprisingly, virtually all of the researchers said that their interaction with practitioners improved their conceptual mastery of the field they were studying (p. 25). Huberman suggests that researchers and their research benefit from engaging in dialogue, over time, with practitioners who have experience with the phenomena in which the researcher is interested and who challenge the researcher. Huberman encourages educational researchers to consider interactive dissemination as a powerful way in which to "empower or refine the conceptual tools with which we researchers ply our trade." (p. 29).



An important finding in Huberman's research is that not only is sustained interactivity useful in ensuring that research is translated into practice but the role of the researcher in that interactivity is paramount. "What researchers do or don't do, along with the investment they make, counts more than do the features of the practitioner environment they engage with" (p. 24). More than the packaging of the findings, the engagement of the researcher in disseminating findings has an impact on whether those findings are acknowledged and considered by potential users (Huberman, 1992; Kaestle, 1993).

Truth and Utility

In deciding what research to believe, teachers and policymakers apply tests of truth and utility. Policymakers look to research that demonstrates high technical quality and findings that fit with their understanding of the issue. At the same time, the research must provide explicit direction for policy. According to Weiss (1989), if the findings challenge convention, all the better. A study that says "more of the same" is not as exciting to policymakers as one that forges a new path. "Keep doing what you're doing" does not provide a framework for legislation.

Teachers likewise seek out truth and utility. They look for research findings that fit with their experience, and, better still, are vouched for by trusted colleagues. On the utility side, teachers look for research findings that can help them improve their current practice. If they can easily implement suggestions and then quickly see results with their current students, they are more likely to continue to implement the new approach or idea (Huberman, 1985).

Constructivism

In a constructivist approach to research utilization, the practitioner constructs meaning out of the research, taking into account the context of her setting and her prior knowledge (Furhman, 1992). The field of adult basic education is experiencing a growing trend toward such an approach. The focus has shifted from considering "information as a brick to be tossed from the system to [a] person . . . [to one that sees information as] . . . clay to be molded and shaped by the perceiver" (Dervin, 1983). Providing research information to practitioners in an accessible form is only the beginning: providing venues for exploration, reflection, implementation, and more reflection are necessary for educational change and improvement to occur.

NCSALL's Efforts

The characteristics of ABE, with its huge cadre of part-time and volunteer teachers, the geographic isolation of many instructors, and the limited opportunities for collegial sharing and professional development have been well documented (see articles on pages 1 and 25). Despite these obstacles, research centers that focus on adult basic education try to work closely with practitioners in developing and disseminating their work. We at NCSALL strive to ensure that the Center's research and dissemination activities contribute to the construction of new knowledge on the part of practitioners, policymakers, and ourselves as researchers as well. We use a variety of methods to do so, including:

- Integrating practitioners into the research process;
- Producing a variety of publications;
- Supporting and collaborating in practitioner research;
- Delivering presentations and participating in workshops.

Integrating Practitioners

NCSALL has been integrating practitioners into its research process via the *Practitioner Dissemination and Research Network* (PDRN), comprised of practitioner leaders who are adult education teachers and administrators in 13 states. The practitioner leaders work with their state ABE and literacy resource center staff to connect practitioners in their states with research and researchers with practice. One of the

practitioner leaders' tasks has been to collaborate with NCSALL researchers. Several practitioner leaders provided assistance to researchers by helping to identify sites for data collection and participating in and recruiting other practitioners to help collect data. NCSALL researchers shared findings with practitioners who were involved in their studies, engaging their help in interpreting findings. NCSALL researcher Rima Rudd, for example, mailed first drafts of findings to all practitioners who participated in her health literacy research and solicited their interpretation of the data.

In 1997, the practitioner leaders conducted focus groups with teachers in nine states. The focus groups were designed to identify the issues of concern to practitioners that could be addressed by research. The participants expressed that, to be useful to them, research results should address issues of concern, have clear implications for practice, and be reported in "user-friendly" language.

Producing Publications

Focus on Basics is one of NCSALL's publications that report research results to members of the field of ABE in formats that are user friendly. Each NCSALL research project was described in *Focus on Basics*, often in the column "Focus on Research." As research activities come to an end, each researcher works with us to write what we hope is a jargon-free article on his or her findings and their implications for practice. Wherever possible, these articles are coupled with articles written by practitioners who have tested some of these findings in practitioner research activities of their own. This provides validity. In Volume 4 A, for example, John Comings, Andrea Perrella, and Lisa Soricone reported findings of their work on learner motivation, which showed that setting and working towards concrete goals helps learner retention. In the same issue, Pam Meader reported on the results of a practitioner research study she had done that implemented that concept with her math students.

Study circle guides are an approach to providing user-friendly research findings for teachers in publication formats that emphasize reflection, a hallmark of constructivism. NCSALL staff produce study circle guides on particular NCSALL research projects that can be used to lead professional development activities. The guides include step-by-step instructions on how to lead the study circles, a variety of activities to use, and the material participants need to read to prepare for the sessions. Sue Barton, a practitioner leader from Virginia, said that talking about what was going on in adult education research brought administrators and teachers closer in the circle she facilitated. The participants in her study circle described the experience as permitting them to reflect on their classroom in light of best practices revealed through research — then move forward, designing a model to improve their own practice (Sue Barton, PDRN electronic discussion list).

"Collaboration between researchers and practitioners increases the chances that research findings will be translated into practice."

The development of "Beyond the GED: Making Conscious Choices about Your Future," a set of materials for GED classes, represents another approach to collaboration between researchers and practitioners that led to reflection and change in both. Teacher Sara Fass wrote the materials to bring the findings of GED research into the classroom to be considered by learners. Researchers John Tyler and Kathy Boudett, who both work on NCSALL GED impact studies, agreed that discussing the issues with learners and providing input during the development of the learning materials allowed for a better understanding of the mechanisms that may be at play in areas of research interest.

Supporting Practitioner Research

One of the most direct ways NCSALL establishes settings of collaboration and reflection for practitioners interested in exploring and applying research findings is by supporting and collaborating in *practitioner research*. NCSALL-supported practitioner research always includes training and support to practitioners as they identify questions from their own practice and conduct research to address them. The questions are all broadly connected to a NCSALL research topic, and in many instances the practitioner researcher makes a direct connection with an academic researcher working on the same general question.

Delivering Presentations

NCSALL researchers make every effort to meet in person with those who are interested to discuss their research as it is being conducted and when findings emerge. Researchers want to know how their findings are interpreted by

practitioners. Researcher team members frequently participate in local workshops and national level conferences. In addition, representatives from the NCSALL dissemination team are present at all major ABE conferences. NCSALL also sponsors policy briefings in which researchers share research findings and discuss implications of findings with state and local program directors.

Despite these efforts, face-to-face contact between NCSALL researchers and practitioners is understandably limited. The *FoBasics electronic discussion list* could serve as a place of "virtual" sustained interactivity through which NCSALL researchers could pose questions to practitioners and vice versa.

New Methods

Beginning next year, NCSALL will launch two new initiatives aimed at creating more opportunities for sustained interactivity and reflection: two *lab sites* and a *research in practice initiative*. The lab sites, one in Portland, OR, and one in New Brunswick, NJ, will provide venues in which researchers and practitioners can work together to test and evaluate applications of research to practice as well as ensure stable sites for ongoing research. The research in practice initiative will connect state professional development providers, literacy resource centers, state adult basic education directors, and a variety of researchers and research centers (NCSALL included) to foster greater interactivity throughout the research to practice cycle.

Conclusion

A strong literacy program here in Boston is known as WAITT House, which stands for "We're All In This Together." The same can be said for researchers and practitioners. We're interdependent in our efforts to improve the educational experiences of adult learners. We know that

> *"Teachers look for research findings that fit with their experience, and, better still, are vouched for by trusted colleagues."*

working together benefits all of us. At NCSALL, as at other research centers, we try constantly to incorporate the expertise of practitioners as we develop research questions, gather and analyze data, consider the policy and practice implications of research findings, and develop mechanisms for dissemination of research findings. We look forward to hearing from you about ways in which we can improve or extend these efforts.

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FINDINGS FROM THE LSAL

Describing the Longitudinal Study of Adult Learning

NCSALL's Longitudinal Study of Adult Learning (LSAL) is a panel study. This type of longitudinal study follows a fixed sample of individuals (the panel) over time. LSAL's data collection involves in-home, in-depth interviews and cognitive assessments of 979 adults, age 18-44, living in the Portland, OR, metropolitan area, who do not have a high school diploma or equivalent, and are proficient English speakers. The participants are being periodically interviewed and assessed over seven years, regardless of whether they enter, stay in, or leave adult education programs, or move from one geographical area to another.

The study was designed to answer fundamental research questions at the center of adult education, learning, and literacy development.

1) To what extent do adults' literacy abilities continue to develop after they leave school?
2) What life experiences are associated with adult literacy development? How do formally organized education programs contribute to the growth over time in individuals' skills and knowledge? Workplace learning? In other learning contexts and activities?
3) What are adult learners' patterns of participation over time in literacy training and education? In other learning contexts and activities?
4) What is the impact of adult literacy development on social and economic outcomes?

Many longitudinal studies use national samples, random samples drawn from across the United States, because findings done with such samples are widely applicable to broad questions of policy. Using a national sample is expensive and logistically difficult. The LSAL draws on a local population, so the findings cannot necessarily be generalized to other areas. One advantage of a local sample is that the population shares a relatively homogeneous context. For example, with a local sample it may be easier to understand how differences among individuals' literacy abilities influence their labor market activities than with a national sample in which individuals are not representative of any particular locale.

The LSAL uses a comparison group design: about half the participants, none of whom had received a high school degree or a certificate of General Educational Development (GED) at the onset of the study, are program participants and half are nonparticipants. This allows us to trace the differences we may observe between the experiences over time of the two groups' back to their participation status. Statistical methods will be used to control for the potentially confounding effects of other influences on comparisons between program participants and nonparticipants.

Each wave of data collection consists of an in-home interview followed by cognitive assessments: a standardized functional literacy assessment as well as measures of vocabulary (vocabulary tests are only administered during the first two waves). LSAL chose the Document Literacy scale of the Test of Applied Literacy Skills (TALS) developed by the Educational Testing Service. Administered in a constructed-response rather than multiple-choice format, the TALS assesses adults' abilities to extract and process written information in a variety of everyday document formats. It is easy to administer and has known psychometric properties suitable for use in a panel study. It was used in the National Adult Literacy Survey, the International Adult Literacy Survey (IALS), and numerous state-level surveys of adult literacy, making the LSAL comparable to those studies. Because literacy programs do not use it, study participants will not have prior experience with it.

Although we have a strong interest in the learning experience of speakers of English as a second language, resource limitations required the LSAL to exclude people from the study who did not speak English proficiently. We hope to include such speakers in future studies. Proficient speakers of English as a second language were included in the study. Participants were recruited by randomly calling telephone numbers in the Portland metropolitan area. Part of the screening process was to determine whether or not the otherwise eligible person had enough English comprehension and expressive ability to participate in the lengthy face-to-face interview. Of the eventual sample, 90% were born in the United States and 88% speak English as a first language, six percent spoke Spanish as a first language, and six percent spoke another first language.

The K–12 School Experiences of High School Dropouts

New data indicate that "school resisters" may be a minority. What does that mean for ABE programs?

by Stephen Reder & Clare Strawn

Initial findings from NCSALL's Longitudinal Study of Adult Learning (LSAL) are challenging the prevailing notion that individuals in the target population for adult education tend to have had negative experiences in K-12 schools, and that these experiences limit their participation in adult education. The LSAL data provide little support for this view, long held by many researchers and practitioners in adult education (Beder, 1991; Quigley, 1990). Based on the idea that prior negative school experiences, difficulties in learning school curricula, and the stigma of dropping out combine to produce "school resisters" who are reluctant to go back to school or participate in programs, many adult educators have attempted to make their programs less school-like. Although a small percentage of the target population studied by LSAL does resemble the typical "school resister," many others do not fit that profile, and, in fact, feel positive about their prior school experiences. Furthermore, among LSAL's target population, individuals who do participate in adult education programs have very similar K-12 experiences to those who do not participate.

Prior School Experiences

By definition, LSAL's study population (see page 12 for details on the study design) is entirely high school dropouts who had not received a certificate of General Educational Development (GED) or equivalent by the time of the first interview. They reported dropping out of high school for diverse reasons. Although it was commonly assumed that pregnancy was one of the leading reasons women dropped out of high school a generation ago, this is no longer the case among LSAL respondents. Fewer than one in 10 (nine percent) reported pregnancy or health-related concerns as the main reason for dropping out. The two most commonly reported reasons for leaving school were boredom or feeling that one didn't belong in school (29%) and school performance problems (26%). A variety of other reasons relating to family, relationships, and employment were also commonly reported (see Table 1).

When individuals were asked to evaluate their overall K-12 school experiences, they reported a wide range of experiences. Their overall evaluations, on a five-point scale ranging from "very negative" to "very positive," are shown in Table 2.

Table 2 makes several points. First, it is not true, as many might believe, that most individuals who drop out of high school have had negative school experiences. A larger percentage (40%) report positive (either "somewhat positive" or "very positive") experiences than report negative ones (28%). Although an identifiable group (11%) of individuals in our study population had "very negative" school experiences, a nearly equal number (10%) had "very positive" experiences. As might be expected, individuals who repeated grades, or who left school because of problems with academic performance, tend to evaluate their overall school experiences more negatively.

Program Participants and Nonparticipants: Similarities and Differences

LSAL is particularly interested in

Table 1. Reasons for leaving school

Reason	Percentage*
Bored, didn't like, didn't belong	29
Problems with school performance	26
Job-related	17
Relationship problems	15
Family issues	10
Pregnancy or health problem	9

*Percentages do not add to 100% because respondent may have selected more than one reason. n=940.

Table 2. Evaluation of K-12 school experience

Overall Evaluation of K-12 School Experience	Percentage*
Very negative	11
Somewhat negative	17
Neutral	33
Somewhat positive	30
Very positive	10

*Percentages may not add to 100% because of rounding. n=940.

contrasting the life experiences of individuals in the study population who do and do not participate in adult education programs. An important and somewhat surprising finding from the first year of data is that within the LSAL population, individuals who have participated in adult education are highly similar to their counterparts who have not participated, in their demographics, previous K-12 school experiences, literacy proficiencies, and other salient variables. Table 3 displays characteristics that do not differ between participants and nonparticipants.

Table 3. **Selected characteristics of the LSAL population, participants and non-**

Demographic characteristic	Percentage
Minority	35
Lives in poverty	34
Welfare recipient in past year	11
Special Education in K-12	34
Weeks worked past year	34

n=940.

Although some statistically significant differences can be found between the two subpopulations, these are usually small in magnitude. For example, the two groups differ slightly in average age. Those who have participated in programs are somewhat younger (average age, 27 years) than those who have never participated (average age, 29 years). The participant group shows a slightly higher percentage (12 %) of immigrants than does the nonparticipant (eight percent) group. A somewhat higher percentage (41%) of adult education participants repeated a grade during K-12 than those who never participated in adult education (33%).

Discussion and Implications

The baseline LSAL data provide little support for the view of the adult education student as a school resister. Although a small percentage of individuals in the target population had very negative K-12 experiences, far more had positive school experiences even though they dropped out before graduating. Furthermore, there is little indication that previous K-12 experiences are a major force in determining who among the target population participates in adult education programs. For example, if we believe that individuals who evaluate their K-12 experiences negatively are less likely to participate in adult education, we should expect a correspondingly different pattern of responses to the K-12 evaluation question among those who do and do not participate in adult education programs. In fact, there is no overall statistically significant difference between the K-12 evaluations of those who have participated and those who have never participated in adult education classes. Although some individuals fit the conception of the "school resistor," they are relatively few. Efforts to reform programs to increase outreach and retention should not assume that negative school experiences are a common barrier. Such models of the adult learner have based their argument on a few compelling case studies of learners, rather than on a broader look at the target population comparing those who do and do not choose to participate in programs

Many of the questions we hope LSAL will answer must await the analysis of subsequent years of data showing change over time in the study population. The baseline data can already contribute important new information to the field of adult education, and will help to dispel prevalent myths. For example, the finding that, within the target population for adult education, those who choose to participate are quite similar in many respects to those who do not participate is important. That these two groups have generally similar K-12 experiences is especially important, because it counters the widespread perception that negative prior school experiences are a major impediment to improving outreach and retention in adult education programs. The two groups might not be as comparable in other locales, where characteristics of both local K-12 schools and adult education programs differ from those in our area (Portland, OR). A lack of comparability elsewhere should be established by research rather than being generally assumed and illustrated by example or anecdote, as has too often been done. The

"Among LSAL's target population, individuals who do participate in adult education programs have very similar K-12 experiences to those who do not participate."

LSAL findings reported here may be broadly applicable. NCSALL's Persistence Study (see *Focus on Basics* 4A, pp. 1-7), which examined a range of adult learners and programs in the northeastern United States, found negative prior school experiences to be relatively unimportant in adult students' reasons for enrolling and persisting in programs.

As follow-up data from LSAL become available, we plan to look more closely at relationships among individuals' previous school experiences, the characteristics of their families of origin, and the ways in which they form life goals. Better understanding of these relationships will help us to understand the part adult education plays in their lives. Understanding the dynamics of these relationships will help us better understand why individuals enroll in adult education programs, the factors affecting their persistence and learning in the programs, and ways in which new program designs could better serve a broader base of potential students.

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Program Participation and Self-Directed Learning to Improve Basic Skills

LSAL's data indicate that self-study is prevalent among high school dropouts. How can ABE programs take those efforts into account?

by Stephen Reder & Clare Strawn

An analysis of baseline data collected by the Longitudinal Study of Adult Learning (LSAL) offers a tantalizing glimpse of the formal and informal learning activities underlying adults' literacy development. Few adult educators will be surprised to hear that many in the LSAL population (see page 12 for a description of the study and the population) participate in adult basic or secondary education programs to improve their reading, writing, and math skills. After all, that's why these programs exist. More surprising is the finding that substantial numbers of adults in the LSAL population engage in self-directed learning activities to improve their basic skills or prepare for the tests of General Educational Development (GED). This is true both for individuals who have previously participated in adult education programs and for those who never have. A better understanding of the relationship between program participation and self-directed study for basic skill improvement could offer some interesting new ways to think about program design and outreach, student retention, and lifelong learning.

The Design of LSAL

The design of NCSALL's Longitudinal Study helps us to investigate these and a range of other important issues in adult literacy and education. Two features of the LSAL design are particularly relevant here. First, the LSAL is a *panel study:* it closely follows the same group of individuals over time. They are periodically interviewed, their literacy assessed, and information is collected about their program participation, informal learning activities, uses of written materials, employment, social networks, personal goals, social and economic status, among other information. The LSAL panel consists of approximately 1,000 individuals randomly sampled from its target population: individuals who, at the time the study began, lived in the Portland, OR, area; were aged 18-44 years; did not have a high school diploma or GED; were not still in high school; and spoke English proficiently. A second major feature is its *comparison group* methodology: approximately equal numbers of the target population were sampled who had or had not recently enrolled in local adult education programs. The design allows us to make important comparisons between those in the target population who participate in programs with those who do not. These comparisons provide new and

important views of the distinctive characteristics of participants and of the contributions that program participation makes to adults' literacy and life development.

Self-Study and Program Participation

Most American research on adults' self-directed learning has focused on professionals and others with relatively high levels of formal education, who are presumed to have "learned how to learn" through their years of formal schooling (e.g., Aslanian, 1980). Few studies have investigated the self-directed learning activities of adults who dropped out of high school. We know little about their self-directed learning, especially among those who never participate in adult education programs. Can they improve their skills on their own? Do they need to participate in formal programs to develop their literacy abilities?

We explored some of these issues a number of ways in the first (or baseline) interviews. For example, individuals were asked about many aspects of their preceding life histories, including whether they had, after leaving school, ever studied by themselves to improve their reading, writing, or math skills or to prepare for the GED. We were careful to differentiate such self-study from homework activities associated with any adult education classes they might have taken. When individuals responded affirmatively, we asked further questions for details about when and how intensively they had studied by themselves to improve their skills.

Although we need several years of data to observe literacy development directly, the LSAL baseline data already indicate that informal, self-directed learning may be an important part of adult literacy development. This component has largely been overlooked by both researchers and programs. One in three (34%) of those who have never participated in adult education programs have studied by themselves to improve their skills. Nearly half (46%) of those who have previously participated in programs have also self-studied to improve their skills or prepare for the GED.

> *"... substantial numbers of adults in the LSAL population engage in self-directed learning activities..."*

Adult educators are often challenged and sometimes frustrated by the high turnover in classes. Data from the LSAL may help us to reconceptualize such sporadic participation in ABE programs as part of a broader process of cumulative skill development over time. Most program administrative data use 12 hours of seat time as the standard for minimum participation (and funding). LSAL quantifies participation in finer detail, recognizing a minimum of one class session as a period of participation. By "period of participation" we mean one or more sessions with the same teacher that ends because the student leaves or the class ends. Periods of participation may or may not conform to the standard number of weeks per term. This focus helps us see more varied and complex patterns of participation. Among those in the LSAL population who have ever participated in classes, more than half (58%) have done so in more than one period of participation. Individuals attending programs in multiple periods of participation often go to different programs, with varying intensities, duration, and reasons for starting and stopping during each period of participation.

This complex, sometimes fragmented process of participation is best captured and understood from the learner's perspective rather than through the lens of administrative data in which students' participation is studied only in relation to the outreach, recruitment, and retention of students in the current program. When analyzing the same LSAL data from two different perspectives, that of cumulative participation hours and that of hours accumulated in individual program attempts, we get two different representations of participation. Framed as individual program attempts, stopping in and out of different classes might be interpreted as a series of failures.

Table 1: **Two ways of counting participation**

Class 1	**Program count**	**LSAL count**
Hours	—	4 hours per week
Weeks	—	2 weeks
Total time in class 1	—	8 hours
Class 2		
Hours	4 hrs per week	4 hrs per week
Weeks	8 weeks	8 weeks
Total time in class 2	32 hours	32 hours
Total participation time counted	1 class, 32 hours	2 classes, 40 hours

Students, however, experience moving in and out of programs as a process of accumulating participation and development over time. In the LSAL survey, students were asked how many classes they had participated in, how many hours per week the class met, and how many weeks they stayed in the class. Table 1 illustrates how the math works out differently if you only start counting class hours after 12 hours of seat time.

We used the initial LSAL data to compare these data and learner perspectives, illuminating somewhat different patterns of participation. If we look at periods of participation *prior* to the baseline (first) interview,[1] on average, learners experience 54 hours (median) of instruction per period of participation. Using the 12-hour threshold common in administrative data, however, we would report only 27 hours. When we look at cumulative hours over periods of participation, on average, 10% of learners stop participating before completing 12 hours of instruction. However, that increases to 22% of students who leave when the 12 hours of participation are limited to one attempt. Instruction appears to have longer duration in the learners' perspective than from the program's frame of measurement. In future reports, we will be able to compare the actual administrative data collected by the state to the self reports of students. When periods of focused study outside of program participation are added to this picture, programmatic perspectives on skill development may shift significantly to reflect learners' experiences more closely.

Learning without Program Participation

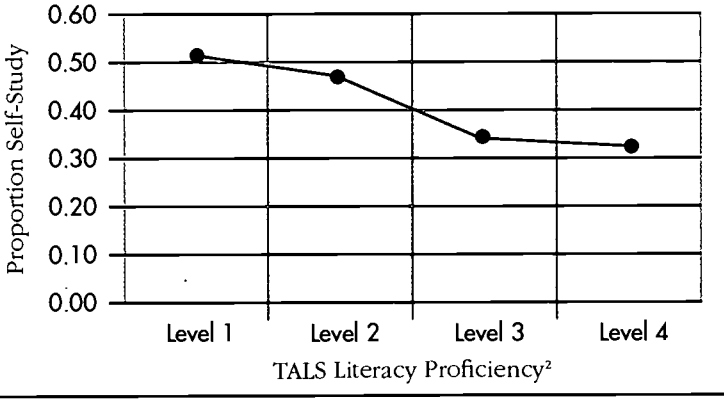
Although it is perhaps not surprising that so many individuals who participate in programs also engage in self-directed efforts to improve their basic skills and prepare for the GED, it is somewhat unexpected that such a large proportion of those who never go to programs also engage in such self-study. This suggests that a substantial reservoir of individuals may be actively trying to improve their skills, and that programs are not reaching or are unable to serve them through their current offerings. Perhaps new conceptions of how to support and enhance such independent learning (through the use of distance technologies and new media, for example) will better connect these learners with adult education programs.

"Students, however, experience moving in and out of programs as a process of accumulating participation and development over time."

Self-Study and Literacy Proficiency

The ability to study on one's own may depend on having certain levels of basic skills. The surprisingly high rate of self-study found in the LSAL population may be related to the study populations' relatively high levels of literacy proficiency. The LSAL population, by definition, is comprised entirely of high school dropouts who have not passed the GED. They do, however, have relatively high levels of literacy proficiency as measured by the Test of Adult Literacy Skills (TALS), which are the scales used in many familiar state, national, and international adult literacy assessments (Kirsch et al. 1993; OECD, 1995). Figure 1 plots the percentage of individuals reporting previous self-study as a function of their assessed TALS literacy proficiency.[2] Instead of the expected finding that individuals with higher skills are more likely to engage in self-study, the figure shows the opposite. Individuals with higher skill levels are less likely to have engaged in self-study efforts to improve their skills or prepare for the GED. Individuals at the lowest levels of skill are the most likely to engage in such self-study efforts; about half of the LSAL population functioning at the lowest proficiency level (level 1) has previously engaged in such self-study activities.

Figure 1: **Self-Study and Literacy Proficiency**



Program Participation and Literacy Proficiency

Literacy proficiency may affect not only self-directed learning of basic skills but also participation and learning within basic skills programs. LSAL data show a clear negative association between students' assessed literacy proficiency and their evaluations of program effectiveness. Table 2 shows that those who are most satisfied with their adult education have lower literacy proficiency scores than those reporting that programs did not help to improve their skills.

Our interpretation of such data will be more definitive after we have directly measured changes in individuals' skills over time. Until then, a tentative interpretation of these baseline data is that local adult education programs appear to assist students within a relatively narrow range of literacy proficiency. Students coming in with skills above this range may not be well served.

Table 2. **Program satisfaction and literacy proficiency**

Extent to which programs helped improve skills	%	Literacy Proficiency*
Not at all	25	290
Somewhat	44	281
A great deal	31	267

* TALS scores.[2]

Is there a relationship between the lower satisfaction with programs and the lower rates of self-study we observed among people with higher literacy proficiency? We might reasonably surmise that dissatisfaction with programs leads people to build on their established skills by studying on their own as an alternative to formal education. However, the data show that those who said that programs helped "not at all" were significantly less likely to engage in self-study than students who answered that programs helped improve their skills "a great deal." Even after we take literacy proficiency into account,[3] there is a positive relationship between self-study and program satisfaction: those students who have also self-studied report that formal programs assisted them more in improving their skills. To understand what this relationship is about, we need to examine data from subsequent years, in which we will have additional information about changing patterns of self-study, program participation, and assessed literacy proficiencies.

Implications

Data from the LSAL may encourage new ideas about adult education students and new models of programs to serve them. Increasing our knowledge about the extent to which individuals who never attend formal programs undertake self-study to improve basic skills and prepare for the GED is part of what we have to learn. These results bring to mind learners who are already engaged and might be served by programs through distance technologies and new media, even though they may not be able or interested in attending programs. As the LSAL continues to document changes in individuals' literacy proficiency and practices over time, the contributions of program participation and self-study to literacy development should become clearer. By measuring development over time, it will be possible to determine whether individuals with higher literacy proficiency choose different methods of skill development than those with lower scores and which strategies for development are more effective than others. Feedback from *Focus on Basics* readers about your interpretation of these findings is welcome, as we continue to design and analyze future waves of data.

1 This particular analysis excludes periods of participation current at the time of the first interview, since such periods by definition would not yet be complete.

2 The TALS Document Literacy proficiency is plotted in the proficiency ranges typically reported, with level 1 the lowest and level 5 the highest. On a 500 point scale, level 1 is 0-225, level 2 is 226-276, level 3 is 276 to 325, level 4 is 326 to 375 and level 5 is 376 to 500. See Kirsh et al., 1993, for a description of these proficiency levels.

3 Statistical models were used to examine the three-way relationship among literacy proficiency, self-study, and program participation.

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Taking Literacy Skills Home

NCSALL research finds that use of authentic reading materials in class increases learners' out-of-class literacy activities

by Victoria Purcell-Gates, Sophie Degener, Erik Jacobson, & Marta Soler

"Before, I would get letters from the children's school and I needed someone [to] read them to me in order to know what they were asking me to do. Now I don't need it."
"I can write a check now."
"I can look at a map now and use road signs."
"I just started using calendars and appointment books."
"I can pick up a newspaper and read the headline now."
"Now I can pick up my Bible, and I can read a scripture."
"I can go to a lunch counter and look on the bulletin board and read it now."

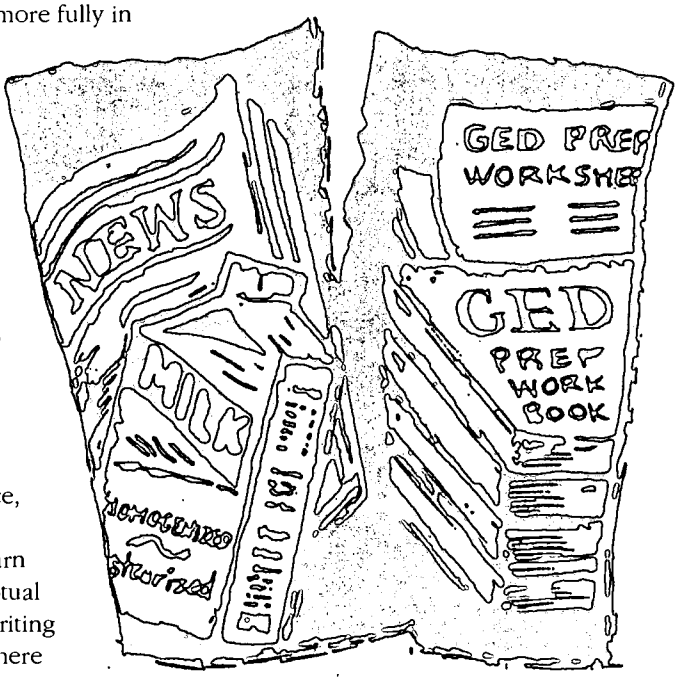
These are just a few of the comments made by adult literacy students who participated in a National Center for the Study of Adult Learning and Literacy (NCSALL) - sponsored study, Literacy Practice of Adult Learners (LPALS). The study looked at changes in the literacy practices of adults as a result of attending adult literacy classes. Results show that students who participate in classes in which real-life literacy activities and texts are used increase the frequency with which they read and write in their daily lives. Such learners also expand the variety of texts they read and write outside of school. This is in comparison to results in students who participate in classes with fewer or no real-life literacy activities and texts.

By looking at these changes, LPALS was measuring an important — one could argue that it is the most important — outcome of adult literacy instruction: the actual application of newly learned literacy skills. Rather than inferring from other outcome measures, such as achievement tests, that literacy skills are applied in day-to-day life, this study looked at those applications directly. It looked at whether or not the adult learners actually use their new literacy skills to achieve their own personal goals, meet their own needs, and participate more fully in their personal and family life.

The significance of the results goes beyond the adult learners to encompass issues of intergenerational literacy success and failure. Children who grow up in homes where adults read and write more, and read and write more types of texts (e.g., coupons, recipes, correspondence, documents, magazine articles, books, etc.) learn more about the conceptual bases of reading and writing than those in homes where adults read and write less. Children who begin school with higher levels of literacy knowledge and familiarity are more successful at learning to read and write.

The Participants

The LPALS research team collected data on out-of-school literacy practices from 173 adults attending 83 different classes across the United States. The adult literacy students represented the range of students in the various types of adult literacy classes in the United States today. They were both native-born and foreign-born and ranged in age from 18 to 68 years. They were currently learning in classes or in tutorial arrangements that reflected a range of configurations: adult basic education (ABE), preparation for tests of General Educational Development (GED), family literacy, Evenstart, and English for speakers of other languages (ESOL). Upon beginning the classes they were attending, the literacy levels of the participants ranged from preliterate (19.1%) to a level of 11th grade and up (7.5%). The majority of the students were reported by their teachers to be reading around the fourth to seventh grade levels (31.2%) when they first began attending the class involved in the study. Women made up 70% of the sample.



continued on p. 20

Using Authentic Materials: Karen

Karen teaches an adult literacy class to a group of women in a Puerto Rican neighborhood in a large city. Issues that arise in the neighborhood often influence the direction that the class goes on any given day. For example, one day some of the students came to class very disturbed. A young girl in the neighborhood had been assaulted. The learners felt that the police, the school, and the community were being very passive about the case. Many women in the class have daughters about the same age as the assault victim, and as they learned more about the case, they, too, became very upset. Karen realized that this issue really mattered to the students, so she devoted much of the next week's instruction to learning more about this case. She brought in different newspapers that covered the case for the students to read and discuss. The class decided to write a letter to the editor about the incident. As the class wrote the letter together, Karen took the opportunity to teach a short lesson on writing a business letter, as well as to go over some spelling patterns. Karen also proposed that the class do some research on issues of women's rights and safety.

Using the Internet as well as other resources, the class spent much time reading about and discussing these issues. At the same time, Karen pulled out unfamiliar vocabulary words from the different resources to work on with the students. Karen likes the fact that she can cover the reading and writing skills that her students need within a context that interests and motivates her students. ❖

Dimensions of Instruction

To relate changes in adult literacy students' literacy practices to the types of instruction they were receiving, the student participants and their current literacy class teachers were recruited to the study together. Teachers of adult literacy volunteered for the project in response to calls put out through the NCSALL network as well as through contacts known to members of the research team. A class, or site, was defined as one teacher and at least one student working together. Thus, among the 83 classes, about one-third of them were configured as tutor-tutee, a common instructional approach in adult basic education.

"Students who participate in classes in which real-life literacy activities and texts are used increase the frequency with which they read and write in their daily lives."

The LPALS team thought that two dimensions of adult literacy instruction might relate to change in literacy practice. The first was authenticity of instruction, or how close the activities and texts used in the class are to actual literacy practice in the world outside of formal schooling. The second dimension was the degree of collaboration that existed between the students and the teachers: the degree to which students and teachers share decision-making for all aspects of their program, including assessment, goal-setting, activities, texts, and program governance. These two dimensions were chosen because they represent best practice among many adult literacy theorists, researchers, and practitioners, and a logical argument can be made for their relationship to literacy practice change among students. Many believe that if adult students are given the opportunity to request instruction around specific texts and activities that are personally important and relevant to them, if they feel a sense of ownership in their schooling, and if they learn the skills of reading and writing through reading and writing real-world texts for real-world purposes, they will be more likely to apply their reading and writing abilities in their lives outside of school. Examples of real life texts include newspapers, driver's license manuals, recipes; real-world purposes include reading newspapers to learn about the news, reading recipes in order to actually cook something. (For a fuller description, see *Focus on Basics,* 2B, pp. 11-14, and 3D, pp. 26-27.)

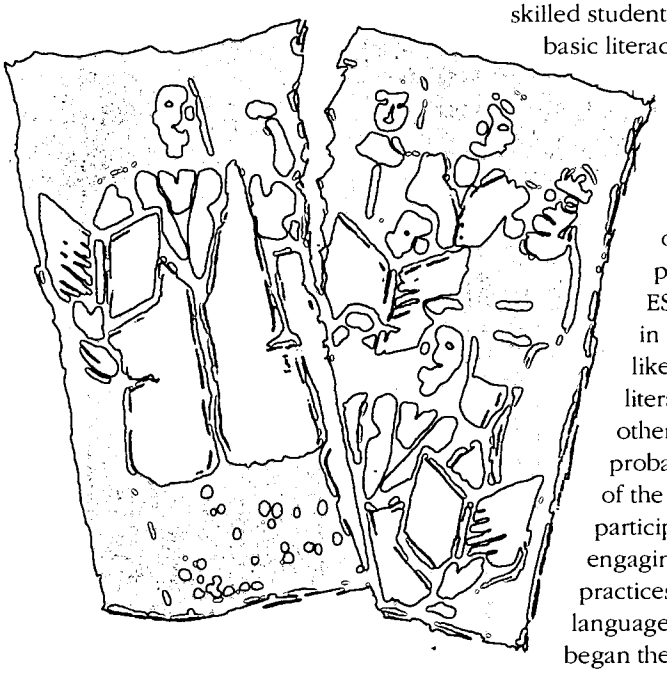
Each class in the study was assigned a score that reflected the class's location along a continuum of practice for each dimension. For authenticity, the four possible scores were 1) highly authentic; 2) somewhat authentic; 3) somewhat school-only; 4) highly school-only. For collaboration, the four possible scores were 1) highly collaborative; 2) somewhat collaborative; 3) somewhat teacher-directed; 4) highly teacher-directed. These scores were used in the subsequent analysis.

Change

Data collectors visited the volunteer participants in their homes at the beginning of their participation in literacy class and at the end. They

asked if students were reading or writing any new types of material since they started attending the literacy class they were currently attending (and on which data had been collected). This information was gathered with the use of a structured questionnaire that asked questions about 50 different literacy practices. The data collector then sent the completed questionnaire to the research office for coding. Each participant was paid $10 per interview.

Results showed that the degree of authenticity in adult literacy instruction had a moderate statistically significant effect on literacy practice change. This was true after controlling for the other factors that also showed independent significant effects on literacy practice change. These factors included literacy level of the student when beginning the program; number of days the student had attended the program; and the non-ESOL status of the student. The degree of collaboration between students and teachers showed no relationship with literacy practice change.



Independent effects are those effects that, after controlling for all other variables that were statistically signficantly related to change in literacy practice, is also signficantly related to change in literacy practice. The strongest independent effect was students' literacy level when they began the classes. The lower the literacy level at the beginning, the greater the change in literacy practices reported by students. This makes intuitive sense: students who are unable to read or write much at all will not be able to engage in many outside-of-school literacy practices. However, as they gain skill, they will begin to use that skill for many of the basic literacy practices — reading signs, food labels, and others — that, across all of our participants, were for the most part already engaged in by the time students began their reading classes.

Complementing this effect was the fact that the longer the students had attended their classes, the more change in literacy practices they reported. Again, this makes intuitive sense if one concludes that low-skilled students will begin to pick up basic literacy practices and then add to them over time as their skill continues to increase.

The negative effect of ESOL status on change in literacy practices means that ESOL students enrolled in ESOL classes were less likely to report changes in literacy practices than were other students. This is probably because many of the ESOL students in the participant pool were already engaging in many literacy practices in their native languages by the time they began their ESOL classes, and focused instead on learning to read and write in English. The final participant pool included relatively few ESOL students so this effect is

Using Authentic Materials: Peter and Christine

Peter and Christine teach an adult basic education class in a large working-class community 40 miles from a large city. The students in their class come from a wide range of backgrounds and they all read at different levels. One of Peter and Christine's major challenges is using materials and activities that reflect the lives of all of their learners. They address this challenge by providing a lot of class time for students to explore their own interests and needs. For example, they have a computer teacher come in once a week to work with individual students on exploring the Internet. The students choose what topics they would like to learn more about, and the computer teacher helps them to access that information. One student wanted to learn more about child support and the laws that enforce payment of child support. The time she spent researching on the Internet helped this student to learn about the laws and also find available resources for helping her to obtain back payments from her ex-husband. Peter and Christine also provide time during each class for students to bring in materials they want to read or write. For instance, one student is trying to upgrade his trucking license, and to do so he needs to pass a test. He brings the test preparation manual to class each night to read during this time. Another student uses the time to write letters to her family in El Salvador. Peter and Christine, as well as a couple of tutors, provide assistance to the students, as needed, during this time. While much of the class time is spent doing whole class activities, such as reading novels or sharing their writing, the students also appreciate the time they have to explore materials of individual, personal interest to them. ❖

probably more of an artifact of the data-gathering for this study rather than a finding that one would wish to generalize to all ESOL students, according to Purcell-Gates.

Authentic Literacy Instruction

These results provide empirical justification for teachers to include real-life literacy activities and texts in their classes. What do these classes look like that do include authentic literacy instruction? The most authentic classes use many types of texts that occur naturally in the lives of people outside of the classroom. For example, some teachers use actual newspapers, magazines, work manuals, job applications, and coupons for literacy instruction. Furthermore, these texts are often, if not always, used for the actual purposes they are used in real life. Newspapers are read to find out about the news, the weather, or current issues of importance and interest to the students. Driver's manuals are read to prepare for an actual driver's test. Job applications are read and filled in as part of real-life job searches. Stories or reports are written and actually published in newspapers or journals connected with the literacy program. Novels are read and discussed in response groups similar to adult book clubs that exist outside of schools.

The next most authentic classrooms used more real-life texts than published textbooks and workbooks but did not use real-life texts exclusively. While the majority of the activities in these classrooms centered around authentic texts, the texts were not always used for authentic purposes. Rather, the activities sometimes mimicked real-life uses of these texts. For example, students wrote letters to an editor of a newspaper in the form found in real newspapers, but the letters were not actually sent.

The results of this study suggest that teachers of adult literacy may want to begin to increase the degree to which they include real-life literacy activities and texts in their classes. These results do not indicate that this is an all-or-nothing change. They indicate that the degree to which authentic literacy activities and texts are included in the instruction is important to think about when teaching for actual use of reading and writing skills outside of the classroom. The LPALS team is currently preparing a teacher handbook designed to help adult literacy teachers apply the results of this study to their own practice.

Acknowledgments

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Victoria Purcell-Gates is Professor of literacy at Michigan State University. She is the author of *Other People's Words: The Cycle of Low Literacy* (1995; Harvard University Press) and (with co-author, Robin Waterman) *Now We Read, We See, We Speak: Portrait of Literacy Development in an Adult Freirean-Based Class* (2000, Lawrence Erlbaum Press).

Marta Soler is an doctoral candidate in language and literacy at the Harvard Graduate School of Education. Her primary focus is the field of adult literacy, where she has worked as both researcher and practitioner. She is currently a member of the Center for Social and Educational Research at the University of Barcelona, Spain.❖

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Sharing What NCSALL is Learning

by John Comings

In the first issue of* Focus on Basics, *Tom Valentine wrote that every adult education practitioner is working under a theory of what works with his or her students. Practitioners usually build that theory through trial and error. As practitioners struggle to help students learn, they try new approaches that they learn from other practitioners, from training, or from reading. When an approach works, practitioners add it to their theory; when it doesn't, they discard it. The National Center for the Study of Adult Learning and Literacy (NCSALL) research is doing the same thing, but it employs a set of procedures that ensures that the insights gained are useful not only to an individual teacher but also to most teachers. The insights gained by NCSALL's research can help you to avoid some, but not all, of the trial and error.

NCSALL designed the research agenda for its first five years of work in 1995, based on the results of a questionnaire that sought research questions from several thousand practitioners, students, policy makers and administrators around the country. The results indicated that practitioners and policy makers were looking for research that answered four broad questions:

- How can the motivation of individual adult learners be sustained and enhanced?
- What impact does participation in adult learning and literacy programs have on an adult's life and how can this impact be assessed effectively?
- How can classroom practice be improved?
- How can staff development more effectively serve adult learning and literacy programs?

These are questions that will take many research studies to answer. In August, 1996, NCSALL began this task by funding a small number of large research projects and a large number of smaller reviews of existing research and best practices. As the article by Barbara Garner et al. on page 8 describes, NCSALL is engaged in many different approaches to research dissemination but, as Wilson and Corbett's article on page 25 describes, dissemination efforts are only half of the job. The other half is building partnerships with state professional development initiatives to maintain a link between research and practice. In NCSALL's second five years, we will work with the Department of Education, the National Institute for Literacy, and the state adult basic education (ABE) directors to develop a comprehensive approach that links research and practice so as to benefit both.

NCSALL is now coming to the close of its fifth year; much of our work is coming to fruition. In 2000 and 2001, NCSALL will make available more research findings than it did during its first four years. This volume of *Focus on Basics* provides an opportunity to share some of that research. Late in 2001, NCSALL will release a paper that summarizes all of its work and analyzes it for practitioners and policy makers.

Although all the research is not yet complete, NCSALL already has advice to offer. I'm going to present here some of what we have learned. Practitioners may find some of the insights offered to be familiar. Much of what research does is confirm widely held common sense, which is important because policy makers want assurance that programs' results are based on evidence. Research can provide the evidence that programs need to advocate for additional funding, and that policy makers need to ensure that tax funds are spent as effectively as possible. Research can also help practitioners to choose where to put their time and energy. Most practitioners know that there are many different approaches to helping their students. Research helps them to choose among them.

Sustaining Motivation

NCSALL's Persistence Study is an example of how research can help practitioners decide where to put their time and energy. The study found that, although some of our students come to programs after negative experiences in school, such experience does not act as a barrier to motivation. Rather, students' goals are more important in sustaining their motivation. Teachers must be aware of their students' goals as they are articulated during program orientation and as they change during program participation. As much as possible, instruction should help students to reach those personal goals. Many aspects of a student's life can act as a barrier to persistence, and programs should help students (through dialogue, counseling, and referral to social services) to identify and overcome them. Students see the support from their family members, friends, fellow students, and teachers as crucial in helping them persist.

ABE programs put part of their energy into helping students persist. That energy can probably best be spent helping students to identify and clarify their goals, the barriers in their lives that may inhibit their persisting long enough to reach those goals, and the

supports in their lives to help them persist. Practitioners then should adapt their instruction to the goals of their students, connect their students to social services that can address the barriers, and build a positive community in their classroom and program to support their students.

Assessing Impact

Most previous studies have found that high school dropouts who have passed the tests of General Educational Development (GED) have higher incomes than those who have not (Boesel et al., 1998). NCSALL's GED Impact Studies have been investigating the link between GED and income to gain a better picture of that impact. We have found that the financial difference between high school drop outs with and without GEDs is not great. More importantly, the studies have found that the impact on income is, in most cases, related to the actual GED score: as a student's score goes up, so does his or her projected income.

Providing students with preparation that allow them to pass the GED test may help them improve their incomes. Helping them improve their skills and pass with high scores on all five tests is more likely to help them increase their income. This is good news. As our students learn more, they do better, and although our research only looked at income, students probably do better in other aspects of their lives as well.

Improving Practice

NCSALL's Adult Reading Component study is finding that about 30 percent of ABE students have limited print skills and about 45 percent have basic print skills but need to develop higher-level print skills (for example, decoding polysyllabic words and words containing less frequently occurring spelling patterns). The study is also finding that most ABE students need instruction and practice to increase their vocabulary, background knowledge, and reading fluency (their speed and ease of reading). All but the most skilled students in English for speakers of other languages (ESOL) classes also appear to need instruction and practice that build their vocabulary and reading fluency. In addition, ESOL students who reported low levels of education appear to be weaker in background knowledge.

"Research can also help practitioners to choose where to put their time and energy."

The preliminary findings seem to show that ABE and ESOL programs must have staff who are trained to identify specific weaknesses in the print skills of their students and provide appropriate instruction to help improve them. The staff must also be trained to help all students engage in reading and discussion that will improve their vocabulary, background knowledge, and reading fluency. When this research is completed, practitioners will be directed to a set of assessment tools enabling them to identify their students' specific strengths and weaknesses in reading, and advice on how to serve them tailored to their needs.

Training Teachers

The NCSALL Staff Development Study has only analyzed some of its data, but it is finding that teachers lack access to resources, professional development and information, colleagues and program directors, decision making, and a "real" job. Faced with such discouraging working conditions, teachers challenge the conditions, cope with them, or leave. Read more about this in the article that begins on page 1.

These working conditions may be one of the reasons that our field has a very high teacher turnover rate. Without better working conditions, advances in teacher training will have only a transitory effect. Later reports from this study will describe ways to improve teacher training, but first our field must solve the turnover problem. NCSALL's research is based on the assumption that working conditions and terms of employment will improve to a point where programs have many more full-time teachers and part-time teachers committed to the field for significant period of time. Of course, NCSALL's research will only become fully utilized when all teachers have access to paid preparation and professional development time.

The Next Five Years

In the next five years, NCSALL will integrate its research into lab sites, which will be collaborations between ABE, ESOL, and GED programs and researchers. These will allow for integrated research to combine everything NCSALL and others have learned about good practice. We will be able to see how to make it work, and measure its impact.

About the Author

John Comings is Director of the National Center for the Study of Adult Learning and Literacy and principal investigator of the NCSALL Persistence Study.

Reference

Boesel, D., Alsalam, N., & Smith, T. (1998). *Educational and Labor Market Performance of GED Recipients.* Washington, DC: US Department of Education.❖

For findings from and information on all NCSALL studies, go to our web site at http://ncsall.gse.harvard.edu or contact Jessica Mortensen at (617) 482-9485. You can also email ncsall@worlded.org.

Adult Basic Education and Professional Development: Strangers for Too Long

by Bruce Wilson & Dickson Corbett

In 1999, the National Center for the Study of Adult Learning and Literacy (NCSALL) invited us to evaluate the impact it was having on the quality of practice and policy in the adult basic education (ABE) field. We set out to determine the extent to which ABE practitioners accessed and used research in their work, with a special interest in NCSALL's work. As we conducted our interviews, we kept hearing laments about the dearth of almost any professional exchanges. This led us to explore the broader topic of professional development and the obstacles ABE practitioners face in taking part in it.

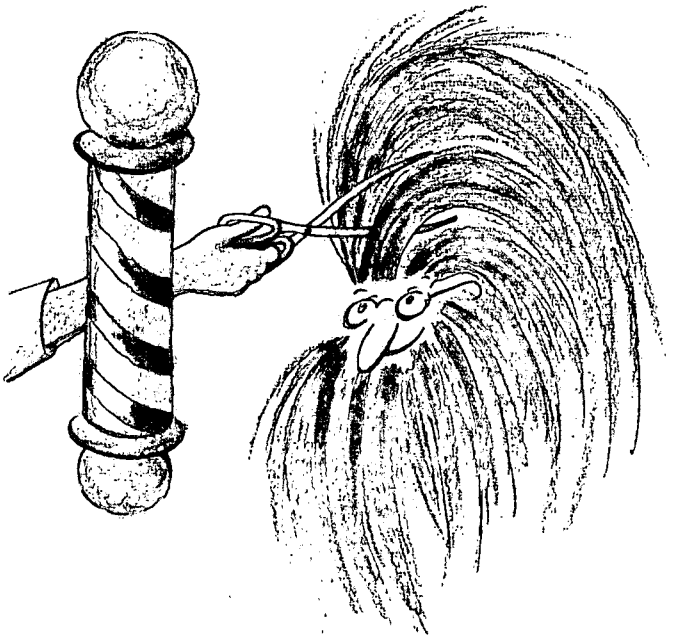
The 60 adult basic education decision-makers and practitioners from 10 states whom we interviewed describe ABE practitioners as starved for professional development and having little opportunity to sate their appetites. The people we spoke with argue that professional development does occur and that it is high on most people's job-related wish lists. However, few individuals participate in these activities to the extent that they think is necessary to grow as educators, and many participate only on their own time and at their own expense. Five factors negatively influence the ability of these people to find paid, professional time to acquire, process, and practice new knowledge and skills. These are distance, time constraints, information gaps, goal mismatch, lack of face-to-face interaction. We will detail them and conclude with some thoughts about possible remedies.

Distance

First, professional development is rarely offered locally: events established by an employing institution or workshops or meetings in close proximity to educators offered by experienced and knowledgeable agencies. The reasons for this are readily acknowledged. The predominance of sparse, dispersed teaching staff (i.e., a small number of teachers having multiple work locations and differing time schedules) makes it difficult for more than a handful of people to be physically proximate very often, especially in rural areas. Traveling to regional, state, or national conferences is usually the only choice for local professional development. Employers vary considerably in the extent to which they encourage and facilitate their staffs' attendance at these events by paying for travel to or participation in professional development activities.

Time Constraints

Because of limited program resources, many ABE educators work part-time. Some welcome this, but many struggle with its professional implications. Essentially, teachers argue, they are paid to teach and do little else. Some are given the equivalent of a class period every so often in which to work on lesson plans but are allotted almost never any paid time to attend conferences, access materials and research, or share information with colleagues. The latter are done on practitioners' own time, if at all. Professional development, therefore, is a sporadic phenomenon in ABE educators' work, dependent upon their almost heroic efforts to participate rather than the concerted, systematic focus of their employing institutions.



Information Gaps

Because the lack of time and money rarely puts practitioners in a position to obtain information about research and practice directly, they must depend on other ABE professionals to steer materials, workshop announcements, and other professional resources their way. As a result, program directors, resource center staff, state coordinators, and teaching supervisors inadvertently become de facto professional development gatekeepers. Some of the people we

talked to who are in these positions acknowledge and embrace the knowledge-brokering aspect of their jobs. Others, like the teachers, say that passing along information and encouraging participation in professional development is only a minuscule, and often not formally designated, part of what they have to do. The flow of research information and professional development opportunities, therefore, is hit or miss and mostly a function of the individual people in these gate-keeping positions.

Goal Mismatch

Practitioners see a connection between the nature of the goals of their programs and the content of their professional development opportunities, which sometimes prevents them from participating in the kinds of training they want outside these limits. For example, several programs seek student outcomes in terms of "lifelong skills," with students becoming constructive workers, citizens, and parents. Teachers in these agencies tend to have access to training on topics such as multiple intelligences, motivation theory, and health and literacy: information that improves their chances of instilling continuous learning skills in their students. Other institutions — either because of an executive director's predilection or a state's mandate — define their purpose in a more short-term, utilitarian way and place a premium on students passing the tests of General Educational Development (GED) and completing the program. Such programs, by necessity, keep an eye out for information that directly enhances GED performance and ensures that their local program operates in compliance with state requirements. In these programs, teachers who want to learn more about how to promote lifelong learning among their students say that they are generally frustrated in their wishes.

The Participants

We conducted interviews with representatives from five states in which NCSALL's Practitioner Dissemination and Research (PDR) Network is active: Kentucky, New Hampshire, Rhode Island, Tennessee, and Vermont; and five states that do not have PDR Networks: Arkansas, Idaho, Minnesota, West Virginia, and Delaware. We tried to match the states along demographic and program lines. We used three strategies to recruit interviewees: referrals from PDR Network leaders, we consulted the National Institute of Literacy's (NIFL) Directory of National and State Literacy Contacts, and used asked our initial contacts for additional contacts (a method known as the snowball). We were interested in talking to people active in ABE, so we did make sure that we had representation from those who teach GED, ABE, and English for speakers of other languages. ❖

Face-to-Face Interaction

ABE educators repeatedly voice a preference for face-to-face interactions about their work, and yet this is the one medium that is most closed to them. They say that they gain the most from sharing experiences directly with others, discussing their successes and failures in an intimate setting, and making sense of new information in concrete terms. Through these face-to-face interactions, they understand better the practical applications of what they learn. This preference, quite obviously, sets educators up for frustration, given all of the reasons above why opportunities in which they can talk with one another and experts so rarely occur. Moreover, only a small minority of ABE educators routinely access print media and the Internet for information: *Focus on Basics* is a popular source.

Strategies

Limited local professional development, the predominance of part-time positions, the individual inclinations of de facto information gate-keepers, the occasional mismatch between agency goals and practitioners' professional interests, and the disjunction between educators' preferred ways of learning and the avenues most available to them combine to stifle the flow of important research- and experience-based knowledge to ABE educators. At a minimum, a two-pronged strategy is needed to address these issues. First, those generating important information for educators must begin to adopt ways of sharing what they know, taking into account the constraints that educators face. This would require more direct contact between researchers, research disseminators, and educators, with the former actually going out into the field instead of having the field come to them. And, just as importantly, the ABE field — led by those in prominent positions — must address the lack of structural and occupational supports for educators to grow professionally.

Currently, the conditions of the ABE occupation are such that those in the field will never be able to participate systematically in the very activities they see as necessary to doing their jobs well. Educators claim the desire for professional development is present; readily accessible opportunities to fulfill that desire are most notably not.

About the Authors

Bruce Wilson and *Dick Corbett* are independent educational researchers. Their primary focus is K-12 educational reform, but they also maintain a keen interest in studying efforts to strengthen adult education. They have written about their work in numerous educational journals and several books, the most of recent of which is *Listening to Urban Kids: School Reform and the Teachers They Want* (State University of New York Press, 2001).❖

Current Research in Adult Learning and Literacy

by Jessica Mortensen

Foremost among the goals of both this publication and the National Center for the Study of Adult Learning and Literacy (NCSALL) is to provide information that is accessible and relevant to the field of adult basic education and by so doing connect research and practice. To further improve this link, we have compiled the following tables which detail research projects currently being undertaken within the fields of adult learning and literacy.

This article represents information gathered from a network of organizations who are affiliated or in contact with NCSALL or whose researchers have previously contributed to this publication. It is by no means comprehensive of all of the research being completed. Table 1 outlines studies being conducted by NCSALL at its partner institutions and other facilities as indicated. Table 2 describes ongoing research projects being completed by institutions other than NCSALL.

If you have further information about studies which have not been included in the following charts, please contact us so that we can add them. While the amended information may not be published again in *Focus on Basics* for some time, we will be posting these descriptions on our web site and updating it as we become aware of other research. To alert us about other projects, please contact Jessica Mortensen, (617) 482-9485 or jmortensen@worlded.org. For more specific information about individual projects than is provided here, please contact the project directors listed below.

Table 1. NCSALL Studies

*Note: an * indicates a NCSALL partner institution*

National Center for the Study of Adult Learning and Literacy (NCSALL)

Harvard Graduate School of Education

101 Nichols House • Appian Way • Cambridge, MA 02138 • (617) 495-4843
ncsall@gse.harvard.edu • http://ncsall.gse.harvard.edu

- **Adult Development** — A test of the hypothesis that coping with the demands of adult life requires a qualitative transformation of mind analogous to the change from magical thinking to concrete thinking required of the school-age child or the development from concrete to abstract thinking required of the adolescent.
  Project Director: Robert Kegan
- **Adult Reading Components** — A portrait of the instructional strengths and needs in reading of adults enrolled in adult basic education and English for speakers of other languages classes.
  Project Director: John Strucker
- **Learner Persistence** — An exploration of the factors that support and inhibit the persistence of adult learners in adult basic education, English for speakers of other languages, and adult secondary education programs.
  Project Director: John Comings

World Education*

44 Farnsworth Street • Boston, MA 02210 • (617) 482-9485 • ncsall@worlded.org

- **Adult Multiple Intelligences** — An examination of how the Multiple Intelligences theory can support and enhance learner-centered instruction and assessment in ABE, ESOL, and ASE programs.
  Project Directors: Silja Kallenbach and Julie Viens, Harvard University
- **Staff Development** — An investigation of current practice, best strategies, and effective models for statewide staff development and a study of the impact and cost-effectiveness of the three most common approaches to staff development for ABE teachers.
  Project Director: Cristine Smith

continued

Table 1. NCSALL Studies, continued . . .

Center for Literacy Studies

University of Tennessee*

600 Henley Street • Suite 312 • Knoxville, TN 37996-2135 • (423) 974-4109 • ncsall@utk.edu

- **Assessment of Outcomes** — Research on the types of impact that participation in adult learning and literacy programs has on adults' lives, ways to assess this impact, and measures of instructional outcome that predict that impact.
  Project Directors: Beth Bingman and Brenda Bell

Graduate School of Education

Rutgers University*

10 Seminary Place • New Brunswick, NJ 08903 • (732) 932-7496 • hbeder@rci.rutgers.edu

- **Teaching and Learning** — An identification of the teaching and learning models used in adult literacy classrooms as part of a wider study that examines the impact that participation in adult learning and literacy programs has on adults' lives and communities.
  Project Director: Harold Beder

Portland State University*

P.O. Box 751 • Portland, OR 97207-0751 • (503) 725-3999 • ncsall@pdx.edu

- **Longitudinal Study** — The construction of a national longitudinal data collection structure that follows adult learners over a long period of time to look at patterns of participation, impact, achievement, and factors that lead to successful learning.
  Project Director: Stephen Reder

Harvard School of Public Health

SPH3 330 • 677 Huntington Avenue • Boston, MA 02115 • (617) 432-3753 • rrudd@hsph.harvard.edu

- **Health and Adult Learning and Literacy** — An exploration of the mutual benefits of introducing health topics into ABE, ESOL, and ASE classes which will build a focus of attention within both the health and adult learning communities on the value of cooperation.
  Project Director: Rima Rudd

Brown University

Education Department • Box 1938 • Providence, RI 02912 • (617) 432-3753 • john_tyler@brown.edu

- **GED Impact** — An investigation of whether or not the acquisition of the certificate of General Educational Development (GED) improves labor market outcomes for school dropouts.
  Project Directors: John Tyler with Richard Murnane and John Willet, Harvard University

Michigan State University

Department of Teacher Education • East Lansing, MI 48824 • (517) 432-4840 • vpgates@msu.edu

- **Adult Literacy Program Typology** — A sorting of the different kinds of literacy programs in operation across the US that places programs in a framework and serves as the foundation for further studies of which kinds of programs best encourage adult learners to read and write outside the classroom.
  Project Director: Victoria Purcell-Gates

- **Literacy Practices of Adult Learners** — An examination of how adults in literacy classes use literacy skills in their everyday lives, the relationship between the degree and type of everyday use of print to the degree of literacy growth, and the types of intervention that might best increase the degree of everyday literacy activity.
  Project Director: Victoria Purcell-Gates

Table 2. Other Studies

Abt Associates, Inc.

4800 Montgomery Lane • Suite 600 • Bethesda, MD 20814 • (301) 718-3168
judy_alamprese@abtassoc.com • www.abtassoc.com

- **Evaluation of Effective Adult Basic Education Programs and Practices** — An investigation of first-level learners' development of reading skills, this study is examining 35 ABE programs nationally to determine the types of learner characteristics, instructional methods, and organizational practices that affect the amount of improvement that adult learners make in their reading skills or reading-related behaviors after participating in adult basic education programs.
  Principal Associate: Judith Alamprese

- **Leadership for Program Effectiveness** — A project which will design and test strategies for developing state and local leaders in adult education. A part of this project is the Northwest Quality Initiative, in which state and local adult education staff from this region of the United States are working together in a program improvement process designed to enhance the quality of instruction and support services provided to adult learners.
  Principal Associate: Judith Alamprese

- **Process Study of Families that Work** — A process study of Families That Work (FTW), one of the components of Washington state's WorkFirst initiative. Abt's study is examining the types of family literacy services that FTW grantees provide and the types of data they collect in order to assess the organization, instructional, and support factors that are associated with grantee's activities.
  Principal Associate: Judith Alamprese

- **Study of the Family Independence (FII) pilot sites** — A process study of 10 pilot sites that the National Center for Family Literacy has funded to adapt their family literacy services to address the needs of existing and former welfare clients. Abt's study is focusing on the strategies that the pilot sites have used to build and organization infrastructure, develop interagency coordination, and provide integrated instructional services to family literacy participants.
  Principal Associate: Judith Alamprese
  NCFL Contact: Jeff Tucker (see below for contact information)

National Center for Family Literacy (NCFL)

325 W. Main Street • Suite 200 • Louisville, KY 40202 • (502) 584-1133 • jtucker@famlit.org • www.famlit.org

- **Evaluation of the Head Start Family Literacy Project** — Working collaboratively with Abt Associates (see above for contact information) NCFL research staff are collecting survey data from training participants at the Head Start Quality Improvement Centers to measure the progress toward project objectives and to improve the overall quality of training for local Head Start providers.
  Contact: Jeff Tucker

- **Impact of the "UPS Careers for Families Project" sites** — NCFL research staff members are currently examining the impact of the various strategies utilized by the UPS Careers for Families Project sites to move recipients into the workplace and out of poverty. These strategies include wage subsidies, work-focused training, support systems, and transition services.
  Contact: Jeff Tucker

RMC Research Corporation

1815 N. Fort Myer Drive • Arlington, VA 22209 • (703) 558-4823 • stromans@rmcarl.com

- **Promising Practices Network** — A component of the National Center for Family Literacy's Head Start Family Literacy Project, (see above for contact information), RMC Research Corporation has been contracted to

continued

Table 2. Other Studies, continued . . .

develop the Promising Practices Network, which will conduct action research within selected Head Start programs to document approaches to family literacy and to provide technical assistance to enhance the capacity of Head Start programs to deliver high-quality family literacy services and engage in a process of continuous improvement.
Contact: Sharron Stroman

American Institutes for Research, Pelavin Research Center

1000 Thomas Jefferson Street • Washington, DC 20007 • (202) 944-5331 • Lcondelli@air.org • www.air.org

- **"What Works" Study for Adult ESL Literacy Students** — The American Institutes for Research is conducting a major study for the Department of Education of ESL programs serving adult learners who have low levels of literacy in their native language. The purpose of this study is to identify ways in which programs can provide effective instruction to improve the English language skills of ESL literacy students. Results of the study will be used to develop indicators and establish benchmarks of program effectiveness.
  Project Director: Larry Condelli
  Subcontract Manager: Heide Wrigley, Aguirre International (650) 373-4923

- **National Reporting System for Adult Education** — The NRS project will establish a national accountability system for adult education programs by identifying measures for national reporting and their definitions; establishing methodologies for data collection; developing software standards for reporting to the US Department of Education; and developing training materials and activities on NRS requirements and procedures.
  Project Director: Larry Condelli

Research Triangle Institute

P.O. Box 12194 • Research Triangle Park, NC 27709 • (919) 541-6313 • BGE@rti.org • www.rti.org

- **Implementation of the Workforce Investment Act: Adult Literacy and Disability Perspectives** — An examination of the Workforce Investment Act's (WIA) implementation from the perspectives of the Rehabilitation Services Administration and the Division of Adult Education and Literacy (USDOE) and the ways in which the WIA affects interagency collaboration and the delivery of vocational rehabilitation and adult education services.
  Project Director: Barbara Elliott

Royce and Royce, Inc.

1938 Crooked Oak Drive • Lancaster, PA 17601 • (717) 569-1663 • sjroyce@earthlink.net

- **Learning for Life: A Longitudinal Impact Study of Pennsylvania's "Adult Education Success Stories"** — A qualitative and quantitative longitudinal study of 70 successful ABLE participants over a period of time ranging from nine months to 22 years. The study was designed to measure and identify academic, life style, and attitudinal changes that occurred as a result of ABLE participation.
  Project Director: Sherry Royce

Center for the Study of Adult Literacy

Georgia State University

University Plaza • Atlanta, GA 30303 • (404) 651-0400

- **Black Female GED Graduates** — An examination of the experiences of black women who have been successful at achieving the certificate of General Educational Developmemt. The qualitative aspect of the study allows the women to reflect on their goals before the GED journey in class and the reality that they have lived since achieving the diploma.
  Project Director: Joanne Kilgour Dowdy (404) 651-0403

- **Linking Low Literate African-American Elderly Adults with Computer-Based Mammography and Breast Cancer Information** — An investigation of the feasibility and efficacy of introducing African American elderly adults in adult literacy programs to computer based mammography and breast cancer information.
  Project Director: Daphne Greenberg
- **Underlying Word Reading Skills of Low Reading Adults** — A series of small studies designed to uncover the underlying linguistic, phonological, and orthographic skills of adults who read below the fifth grade level.
  Project Director: Daphne Greenberg

U.S. Department of Education

Rehabilitation Service Administration

Mary E. Switzer Building • 330 C Street SW • Washington, DC 20202
(202) 205-9883

- **Vocational Rehabilitation and Adult Basic Education Services** — A longitudinal study of 8,500 Vocational Rehabilitation Services (VR) clients over three years at sites in 37 states. The project will test the results of providing Adult Basic Education services to VR clients.
  Contact: Harold Kay

National Center on Adult Literacy

University of Pennsylvania

Philadelphia, PA 19104 • (215) 898-4539 • ginsburg@literacy.upenn.edu
www.literacy.org

- **Evaluation of the Pennsylvania Workforce Improvement Network** — NCAL is conducting an evaluation study of the impact of a new statewide program designed to help adult basic education providers develop a centralized, market-driven system of services for employers and incumbent workers.
  Contact: Lynda Ginsburg

Institute for the Study of Adult Literacy

The Pennsylvania State University

102 Rackley Building • University Park PA 16802-3202 • (814) 863-3777

- **Evaluation of Pennsylvania's Family Literacy Programs** — A multi-year evaluation of Pennsylvania's family literacy programs to determine the effectiveness of the programs in serving eligible families, building local partnerships to support family literacy services, and providing family literacy instruction of sufficient intensity and duration to produce positive educational outcomes for participating adults and their young children. Results from the evaluation will guide development of performance indicators (standards) for family literacy programs and inform Pennsylvania's family literacy program performance initiative.
  Project Director: Barbara Van Horn (814) 865-5876

About the Author

Jessica Mortensen is a Staff Associate at World Education in Boston and member of NCSALL's dissemination team.

Focus on Basics Electronic Discussion List

Focus on Basics electronic discussion list is a forum for discussion about the articles published in *Focus on Basics*. It is a place to converse with colleagues about the themes examined in the publication; to get questions answered and to pose them; to critique issues raised in the publication; and to share relevant experiences and resources.

To participate in the *Focus on Basics* discussion list (it's free!), go to the LINCS homepage at http://nifl.gov. Choose "Discussions." Scroll down to and click on "*Focus on Basics*." Then click on "Subscribe," which is to the left, and follow the instructions. Or, send an e-mail message to LISTPROC@LITERACY.NIFL.GOV with the following request in the body of the message: SUBSCRIBE NIFL–FOBasics firstname lastname
Spell your first and last names exactly as you would like them to appear. For example, Sue Smith would type: subscribe NIFL–FOBasics Sue Smith

There should be no other text in the message. Give it a couple of minutes to respond. You should receive a return mail message welcoming you to NIFL–FOBasics.

The manager of this list is Barbara Garner, editor of *Focus on Basics*. She can be reached at Barbara_Garner@WorldEd.org. Please DO NOT send subscription requests to this address.❖

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Volume 4, Issue D: April 2001

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Elaine Gammell, Portland, OR

BLACKBOARD

Health Literacy

- NCSALL has a new web site, Health Literacy Studies.
  http://www.hsph.harvard.edu/healthliteracy
  This site is designed for professionals in health and in education who are interested in the issue of health literacy.

- *In Plain Language,* a 15-minute video that brings attention to the importance of literacy to health, is now available from NCSALL. *In Plain Language* expands the current notion of health literacy from a medical definition to a broader public health definition, highlighting the importance of health literacy at home, at work, and in the community. The video is available for $10; to order, please email ncsall@worlded.org or call Jessica Mortensen at (617) 482-9485 X535.

Adult Multiple Intelligences

- Information on NCSALL's Adult Multiple Intelligences research is now available via the Adult Multiple Intelligences web site at pzweb.harvard.edu/ami. The site features articles, resources, and a sharing center for those engaged in using multiple intelligence theory in their classrooms or programs.

- A NCSALL Occasional Paper, *Multiple Intelligences in Practice: Teacher Research Reports from the Adult Multiple Intelligences Study,* a 250-page volume edited by Silja Kallenbach and Julie Viens, is now available. It's an excellent example of teacher research as well as a very informative source on Multiple Intelligences. It can be downloaded from NCSALL's web site http://ncsall.gse.harvard.edu, or purchased for $10 by contacting by emailing ncsall@worlded.org or calling Jessica Mortensen at (617) 482-9485 X535.

Change in Literacy Practices

- NCSALL Reports #17: *Affecting Change in Literacy Practices of Adult Learners: Impact of Two Dimensions of Instruction,* by Victoria Purcell-Gates, Sophie Degener, Erik Jacobson, and Marta Soler, is now available. Download it from NCSALL's web site, http://ncsall.gse.harvard.edu, or order a printed copy for $10 by emailing ncsall@worlded.org or calling Jessica Mortensen at (617) 482-9485 X535.

Research and Development Plan

- *A National Plan for Research and Development in Adult Education and Literacy,* a new publication from the National Institute for Literacy (NIFL), NCSALL, and the Office of Vocational and Adult Education (OVAE), represents a collaborative effort to set a research agenda for the field of adult basic

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NCSALL Web Site

Visit our web site for all issues of *Focus on Basics.*
http://ncsall.gse.harvard.edu

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