Adult Literacy and Postsecondary Education Students: Overlapping Populations and Learning Trajectories

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Concerns about improving the literacy proficiencies of the nation's adults are increasingly evident in public discourse about education and workforce policy in the United States. Improved adult literacy has become a national education goal. Recent proposals to upgrade the skills of America's workforce and promote lifelong learning (among them the President's 1999 State of the Union address, the 1999 White House Lifelong Learning Summit, and the administration's fiscal year 2000 budget request) have highlighted the need to raise levels of adult literacy. This discussion has focused on expanding and strengthening the country's adult education system, which historically has served adults needing better basic skills and high school equivalency. The focus of adult literacy education programs in the United States has traditionally been to prepare adults who have not completed high school to gain the skills and knowledge needed to pass the GED (General Educational Development) tests or otherwise obtain high school equivalency certification.

The high school diploma or equivalent at one time did provide individuals in the United States with reasonable access to well-paying jobs and other resources and opportunities. Changes in technology, labor markets, and globalization, however, have increasingly demanded that individuals now obtain not only the skills and knowledge traditionally learned in high school (and certified by the GED) but also postsecondary education and credentials. As a result, demand for and access to postsecondary education has dramatically expanded in the United States since World War II. Increasing numbers of adults who in earlier eras might not have participated in postsecondary education are now attempting to obtain a college education and degree. Many of these students, whether enrolled in four-year, two-year, or proprietary training institutions,1 have high school diplomas but have not developed the

reading, writing, and math skills needed to succeed in postsecondary programs. Helping these students, as well as adults without high school credentials, to improve their basic skills is required if we are to meet the goal for adult literacy set by the National Education Goals Panel (1997).

THE CHANGING FACE OF THE NATION, ITS EDUCATIONAL INSTITUTIONS, AND ITS ADULT STUDENTS

For many adults, there is much more at stake here than just meeting educational goals that someone else has set. Education is critical for labor market success, and it is now clear that in the United States, economic gaps between the education haves and have-nots are widening, reflecting increasing economic returns to higher education (see, for example, Grubb, 1997). Recent data released by the U.S. Bureau of the Census, for example, indicate the continuing relative erosion of earnings for those with little formal education. According to March 1998 census data, the mean annual earnings of U.S. adults age eighteen and over rise dramatically with education: 2

No high school diploma/equivalent: $16,124
High school diploma/equivalent: $22,895
Associate's degree: $29,877
Bachelor's degree: $40,478
Advanced degree: $64,229

Literacy skills are also important determinants of individuals' labor market outcomes. At given levels of education, increasing levels of literacy are associated with, for example, higher expected earnings (Finn & Gerber, 1998; Harrington & Sum, forthcoming). As Figure 4.1 shows, individuals need both educational credentials and high levels of literacy. Data in the figure are from the National Adult Literacy Survey of 1992, which assessed the prose, document, and quantitative literacy abilities of a random sample of the nation's adults age sixteen and above (Kirsch, Jungeblut, Jenkins, & Kolstad, 1993).

The data in the figure show median earnings as a function of highest degree obtained and assessed literacy proficiency.3 To obtain livable incomes, most individuals need to "climb the hill" contoured in the figure-that is, obtain both postsecondary credentials and relatively high levels of literacy proficiency. Elsewhere I have shown that both literacy skills and postsecondary educational credentials enhance adults' economic outcomes as well as their access to lifelong learning opportunities (Reder, forthcoming).

Literacy Development and Literacy Selection

Although both educational credentials and literacy skills are

economically important, they are not necessarily the by-product of the same learning experiences. In the United States and many other industrialized societies, of course, there is a strong association between literacy skills and educational attainment. In a recent study (1998a), I distinguished two kinds of literacy processes underlying the strong positive correlation observed between educational attainment and literacy proficiency. On one hand, the more schooling individuals participate in, the more their literacy develops and the more proficient they become. I termed this a literacy development process. On the other hand, literacy proficiency is often a gatekeeper that limits individuals' access to educational opportunities; successively higher levels of education become increasingly selective in terms of their literacy requirements. I termed this selective filtering of literacy proficiencies through the educational system a literacy selection process. It is important to note that both individuals (through self-selection) and educational institutions (through selective admissions and retention practices) implement literacy selection processes. Literacy selection often acts as a gatekeeper for access to both postsecondary education and career ladders.

We will see that the concepts of literacy development and literacy selection are central to understanding the overlapping relationships between the student populations in adult education and postsecondary programs. There are tensions between policies and programs designed to promote effective literacy development and those designed to promote effective literacy selection. Understanding the difference between literacy development and literacy selection may prove particularly helpful in designing new policies and programs to coordinate basic skills education better across the adult education and postsecondary education arenas.

Expanding Contexts for Adult Literacy Development

There have been two broad categories of societal response in the United States to these increasing demands for more literacy and more education: the expansion of adult literacy training and the expansion of postsecondary education.

Sticht (1998) documents the ongoing historical expansion of adult literacy training within federally funded adult education programs. Besides growth in the overall number of adults being served, Sticht describes the changing composition of the adult learners who participate, particularly the increasing percentage of English for speakers of other languages (ESOL) students.

Another important change in the composition of adult education students can be found in the data collected in the recent National Evaluation of Adult Education Programs (NEAEP). Reporting on program clientele

characteristics surveyed by the NEAEP, Development Associates (1993) estimated that 33 percent of the participants in federally funded adult education programs in 1991ñ1992 had a high school diploma, equivalency, or above. A significant fraction of these high school graduates were individuals born and educated outside the United States who may need English-language skills or U.S. educational credentials, or both. A clearer picture emerges from disaggregating these results by nativity using the NEAEP public use data set. Among U.S.-born adult education participants, 14 percent had a high school diploma, equivalency, or a higher degree.4 Thus, a substantial fraction of individuals who did not need to participate in federally funded ABE (adult basic education), ASE (adult secondary education), or ESOL programs to obtain a secondary credential nevertheless chose to participate in these basic skills training programs.

Since some individuals receiving public assistance or unemployment benefits may have been referred or even mandated to participate in basic skills programs, it is possible that high school graduates participated because of their welfare or employment status. If this were the case, we might want to think about their participation as related less to their goals and more to the goals of some public agency. To examine this possibility, I compared the welfare and labor force status of program participants who did or did not have a high school diploma or above. There were no significant differences in the labor force or welfare status of these two groups of adult education students. The NEAEP also asked students about their reasons for participating. I compared the reasons given by students with and without the high school diploma or equivalent. A diverse set of reasons was provided by both groups, with no obvious differences between the reasons or goals given by the two groups for participating in these basic skill programs.

It thus seems reasonable to conclude that many individuals, regardless of whether they have a secondary credential, seek to improve their basic skills through participation in adult education programs. Federally funded programs, traditionally designed to serve adults lacking such credentials, are now serving a broader population, including adults who already have the credentials to participate in postsecondary education and training. Many of these high school graduates participating in basic skills training may be actively preparing for or even already enrolled in postsecondary education or training.5

In addition to such growth in the size and capacity of the adult education system, strong indications emerge that adult literacy training is increasingly taking place in other contexts as well. A recent review of research on adults' participation patterns in basic skills training examined a number of national surveys conducted during the 1990s (Reder,

1997b). Analysis of these nationally representative data sets indicates that basic skills training is broadly distributed among the adult population at diverse levels of education and literacy proficiency. The poor correspondence between the participation patterns revealed by these surveys and those evident in the administrative databases of adult education programs suggests that many adults are probably receiving basic skills training outside federally funded adult education programs-including programs in postsecondary education institutions and in the workplace.

Further evidence about the increasing role of the workplace in providing basic skills training comes from a study conducted by the American Management Association based on an annual survey of businesses that asked whether companies were providing remedial training. The survey results indicate rapid increases in the provision of basic skills training by the private sector. Here is the estimated percentage of all companies providing remedial basic skills training by year (National Alliance of Business, 1996, p. 6):

1989 3.8 percent
1990 13.5 percent
1991 14.8 percent
1992 17.6 percent
1993 20.2 percent
1994 20.0 percent

Adult Literacy and the Expansion of Postsecondary Education

Another important response to the increasing economic demands for postsecondary credentials and higher levels of literacy has been the expansion of access to postsecondary education for students who in earlier times were unlikely to go to college. The earliest federal access policies sought to overcome financial barriers to postsecondary education. Beginning with the GI Bill after World War II, these policies focused on helping returning veterans. With the passage of the Higher Education Act of 1965, the initial focus of access policies on ameliorating financial barriers broadened. Lack of either academic preparation or essential basic skills was no longer seen as a legitimate barrier to postsecondary education. Some institutions lowered admissions standards, and others opened their doors to nearly anyone seeking a college education. During this period, community colleges grew considerably, as did four-year schools that provided easier or even open admissions to high school graduates (Ruppert et al., 1998).

This increased access to postsecondary institutions resulted in the enrollment of large numbers of adults with relatively poor basic skills, in

turn driving the expansion of developmental or remedial education programs within vocational schools and two-year and four-year colleges. When we examine data on the extent of remedial basic skills education, we will find that a large percentage-perhaps between one in four and one in three-of undergraduate students enroll in such remedial courses. Many of these students might not have gone to college without the support of such access policies.

Many of these nontraditional students are women or members of minority groups, and they tend to differ in other important ways from the college students typical of earlier eras. Often juggling program enrollment and class attendance with demanding employment and family responsibilities, many students are able to attend only part time and may take many years to complete programs and earn their degrees (Bach et al., forthcoming; Horn, 1996). Many of these students exhibit complex patterns of enrollment and attendance involving multiple institutions. Some students may begin their postsecondary education in a community college and later transfer to a four-year institution to complete a bachelor's degree. Other students, particularly those in urban areas, enroll concurrently in multiple institutions, accumulating credits across institutions and programs to attain degrees and achieve personal goals (Bach et al., forthcoming).

Researchers have considered traditional college students to be those who enter postsecondary education directly after high school and attend full time until graduating two or four years later. In contrast, nontraditional students have been identified in terms of seven characteristics:

- Delayed enrollment (that is, older age at the start of postsecondary education)
- Part-time attendance
- Financial independence
- Full-time employment while enrolled
- Having dependents other than a spouse
- Being a single parent
- Not having obtained a standard high school diploma (see, for example, Horn, 1996)

Using composite indexes of nontraditionality constructed from these factors, researchers have found steady increases in the overall nontraditionality of college students in recent years. They have also found less persistence and degree completion to be associated with increasing amounts of nontraditionality (Berkner, Cuccaro-Alamin, & McCormick, 1996; Horn, 1996; Horn & Berktold, 1998; Kojaku & Nunez, 1998).

Enduring Controversies Surrounding Remedial Education

Some enduring controversies likely must be addressed before better coordination can be established between basic skills education in postsecondary programs and adult education programs. Questions and tensions arise around issues of turf, budget, program design and control, and the appropriateness of offering basic skills programs in postsecondary settings. The lowering of basic skills standards for admissions and the concomitant provision of remedial courses have been particularly controversial, often pitting higher educators against each other (Ballard & Clanchy, 1988; Hull, 1998; Mickler & Chapel, 1989). Critics of expanded academic access to and remedial support for postsecondary education argue that students without the literacy skills needed to succeed academically should not be admitted (that is, a literacy selection position). Proponents of broader access, on the other hand, argue for equity of opportunity: rather than being penalized for their poor academic preparation, they believe that these students should be provided with additional opportunities and support for strengthening their basic skills (that is, a literacy development position). Levin, Koski, and Bersola (1998), responding to the chronically marginalized and stigmatized status of students in remedial courses, suggest that these students might be more effectively served by innovative programs designed to "accelerate" rather than "remediate" their skill development.

This debate has become political and highly charged. In many states that once supported the broadening of access to higher education, policymakers and legislatures have scaled back financial support, often targeting students with poor basic skills. Admissions requirements have been tightened and budgets reduced for remedial programs. The City University of New York, for example, has reversed its historical course by ending its open admissions policy and decimating its remedial programs (Cooper, 1998). In Atlanta, Georgia State University decided to forgo more than $1.5 million in credit-hour revenues by not admitting any developmental students during 1998ñ1999 in order to "improve its image" (S. Gowen, personal communication, 1998). And the California State University system adopted a policy in January 1996 that substantially scaled back remedial courses on its twenty-two campuses. Other examples abound.

The Need for a Comparative Picture of Adult Literacy and Postsecondary Students

Postsecondary education-like the workplace-has become an important but controversial venue for basic skills training. New legislation, such as the Workforce Investment Act (WIA) of 1998, and recent proposals of the Clinton administration for broadening adult literacy education seek to coordinate basic skills training with workforce upgrading and lifelong learning. Surprisingly, little effort has been made to develop improved

policy and programs for coordinating basic skills education either within postsecondary education or between postsecondary institutions and other types of adult basic skills programs.

Perhaps this is understandable in part because there is little research to inform these issues. In particular, little information has been available about the literacy abilities of the nation's postsecondary students or the way in which their abilities compare with those of adult literacy students, other prospective college students, and the general population.

LITERACY PROFICIENCY AND POSTSECONDARY EDUCATION

Previous large-scale research on the educational characteristics and outcomes of postsecondary students has generally relied on college admission tests such as the SAT and ACT, grades, and persistence and attainment measures. Comparable information is typically not available for adult literacy learners outside postsecondary institutions and may even be incompletely compiled for students inside postsecondary institutions. It has thus been difficult to compare systematically the literacy proficiencies of adults inside and outside of postsecondary institutions. Using data from the 1992 National Adult Literacy Survey (NALS), I present a new comparative analysis of the postsecondary students' literacy proficiencies.

National Adult Literacy Survey

Because I make considerable use of secondary analyses of the NALS data, it will be helpful to review briefly the major features of this survey. The NALS survey, conducted by the Educational Testing Service under contract with the National Center for Education Statistics, used an adult literacy profiling approach developed by Irwin Kirsch and his colleagues. This approach combines individual assessment methods based on item-response theory with large-scale population survey methods to profile the literacy proficiencies of adults on three defined literacy scales: prose, document, and quantitative literacy. NALS participants responded to a series of open-ended literacy tasks, such as completing a form, locating requested information on a map, extracting information from newspaper articles, and processing numerical information from charts and diagrams. Literacy proficiency scores on 0 to 500 point scales were estimated for respondents based on their responses to these functional literacy tasks. (Technical details of the survey and assessment techniques are described in Campbell, Kirsch, & Kolstad, 1992; Kirsch, Jungeblut, Jenkins, & Kolstad, 1993; Mosenthal & Kirsch, 1994.)

The NALS data analyzed here are from the household sample of 24,944 individuals randomly selected from the U.S. noninstitutionalized

population age sixteen and above. These individuals were contacted and interviewed in their homes between January and August 1992. In addition to performing the simulated functional literacy tasks, survey respondents answered questions from an orally administered background questionnaire. Questionnaire responses provided information about participants' demographic characteristics, educational status and experiences, employment and training experiences, economic status, perceptions of and uses of literacy and various languages spoken in the home, and other background information.

Literacy Proficiencies of Postsecondary Students

Previous research with the NALS has compared the literacy proficiencies of adults at different levels of educational attainment (Baldwin, 1995; Barton & Lapointe, 1995; Kirsch, Jungeblut, Jenkins, & Kolstad, 1993; Howard & Obetz, 1998; Reder, 1998a). These studies all report monotonically increasing levels of adult literacy with each year of additional education. Such comparisons are very helpful, of course, but are somewhat indirect indicators of the literacy skills of the population of enrolled postsecondary students at any given level. Displays of literacy proficiency as a function of highest degree attained reflect the skills of adults who have completed given levels of postsecondary education but exclude individuals who completed the preceding level and are working toward completion of the given level, as well as individuals who completed the given level and are working toward completing the subsequent level. A further complication in interpreting displays of the adult population's literacy in terms of educational attainment is that many adults completed their postsecondary education years prior to the assessment, so that their assessed skills may not be representative of the population of postsecondary students at any given time.

IDENTIFYING CURRENTLY ENROLLED POSTSECONDARY STUDENTS WITHIN THE NALS. Fortunately, it is possible to identify and examine the characteristics of a representative subsample of currently enrolled postsecondary students within the NALS database. Two background questions asked about whether individuals were currently enrolled as students and, if so, working toward what degree. By identifying correspondents who are no longer in high school, are currently students, and are working toward a postsecondary credential, we can operationally define a subpopulation of currently enrolled postsecondary students within the NALS database. Within this group of currently enrolled postsecondary students, we can distinguish the following subgroups in terms of the degree they expect to receive: vocational/trade/business certificate, associate's degree, bachelor's degree, or advanced or professional degree.

Before describing the literacy proficiencies of the population of

postsecondary students, it is important to validate that the population identified within NALS in this manner corresponds reasonably to and is representative of the population enrolled in postsecondary institutions at the time the NALS data were collected.6 This cross-validation can be accomplished by comparing several sources of information about the size and characteristics of the U.S. postsecondary population at similar points in time:

- NALS: Winter-Spring-Summer 1992
- Integrated Postsecondary Education Data System: Fall 1991
- Integrated Postsecondary Education Data System: Fall 1992
- U.S. Census Bureau, Current Population Survey: Fall 1991
- U.S. Census Bureau, Current Population Survey: Fall 1992

The Integrated Postsecondary Education Data System (IPEDS) is an annual compilation of information about postsecondary institutions and their students carried out each fall by the U.S. Department of Education. The Current Population Survey (CPS) is a monthly general population survey conducted by the U.S. Census Bureau, with a supplement devoted to education each October. In order to bracket the NALS data, collected during the winter and spring of 1992, we compare both the fall 1991 and fall 1992 data from IPEDS and from CPS.

Table 4.1 displays the estimated size of the currently enrolled postsecondary student population from these disparate sources. The table shows the estimated numbers of undergraduate and graduate and total postsecondary students according to each source. Two columns are listed for the NALS; the left NALS column includes students pursuing vocational/trade/business certificates as well as those pursuing academic degrees, whereas the right NALS column includes only those pursuing academic (two-year, four-year, or graduate) degrees. Many of the analyses exclude nonacademic enrollees to maintain a higher level of comparability with other sources and classification systems.7

In general, a reasonable overall match exists between the population sizes estimated by NALS, IPEDS, and CPS for this time period. NALS seems to underestimate undergraduate and overestimate graduate enrollment, but considering the differences in information sources and survey methodology involved, the correspondence seems fairly reasonable. Further evidence of the comparability of these postsecondary student populations is provided in Table 4.2, which compares the demographic characteristics of the academic enrollees estimated by NALS and IPEDS.8

Table 4.2 displays very similar demographic characteristics for the

currently enrolled postsecondary student population as identified through two quite different sampling frames. These results should increase confidence in the validity of the NALS subpopulation identified as postsecondary students. We next turn to profiling some of their important literacy characteristics.

LITERACY PROFICIENCIES OF POSTSECONDARY STUDENTS. Figure 4.2 displays the mean NALS literacy proficiencies for enrolled postsecondary students expecting degrees at the vocational, associate's, bachelor's, and postgraduate levels. Each cluster of bars in the figure shows the mean proficiency of a given literacy scale (prose, document, quantitative, or combined).9 Proficiency scores are each scaled 0 to 500 and are broken down into five proficiency ranges, termed Level 1 (lowest) through Level 5 (Kirsch, Jungeblut, Jenkins, & Kolstad, 1993). Horizontal lines in the figure denote performance thresholds between adjacent proficiency levels. For example, the horizontal line at the scale value of 225 is the threshold between Level 1 and Level 2, and the horizontal line above it at the scale score of 275 marks the threshold between Levels 2 and 3.

The same pattern is seen in the cluster of bars for each literacy scale. Currently enrolled postsecondary students have progressively higher mean literacy proficiencies at progressively higher levels of postsecondary education. Notice that these mean proficiency levels are at or above the threshold of Level 3 identified by the National Educational Goals Panel (1997) as the standard benchmark for adult literacy. The mean proficiencies of postsecondary students seeking vocational, trade, or business certificates are just at this threshold level, whereas the mean proficiencies of students in higher levels of postsecondary education are progressively higher, eventually surpassing the Level 4 threshold among postgraduate students.The fact that mean proficiency scores reach such levels does not, of course, imply that the proficiencies of all students are at that high a level. Figure 4.3 shows the corresponding percentages of students at each postsecondary stage who score below the Level 3 benchmark on the various literacy scales.

At progressively higher levels of postsecondary education, fewer of the enrolled students have proficiencies below Level 3. In the certificate programs, roughly half (46ñ54 percent) of the students have subbenchmark proficiencies across the prose, document, and quantitative scales, with most low scores occurring on the quantitative scale. Among associate's degree candidates, 23 to 30 percent have subbenchmark proficiencies. The corresponding percentages for bachelor's candidates are 12 to 16 percent, whereas only 8 to 10 percent of graduate students have a given proficiency below Level 3.

Substantial numbers of postsecondary students have proficiencies below Level 3. How many of these students have proficiencies at the lowest proficiency range (that is, Level 1)? Figure 4.4 displays the corresponding percentages of postsecondary students scoring in Level 1. Very small percentages of postsecondary students appear to be functioning at the lowest literacy level on any of the scales (proficiency score less than 225). Only 2 to 3 percent of students in baccalaureate or advanced degree programs have one or more proficiencies in Level 1, whereas more than 20 percent of students in certificate programs score at Level 1 on one or more proficiencies (most often on quantitative literacy). On all but the quantitative scale, less than 5 percent of two-year candidates score at the lowest proficiency level.

Analyses in the remainder of this section will be limited to students in academic degree programs (that is, the associate's, bachelor's, and advanced degree levels). This encompasses approximately 13.3 million currently enrolled students.10 The literacy proficiencies of these academic postsecondary students are displayed in Table 4.3. The proficiencies on the various literacy scales exhibit nearly identical means and distributions over the five proficiency levels. From 15 percent to 17 percent of these students have literacy proficiencies below Level 3, with the preponderance of these students' sub-benchmark scores in Level 2.

More than one in five (22 percent) postsecondary students perform below Level 3 on one or more of the three NALS literacy scales. This represents a population of 2.9 million students performing at Level 1 or 2, of whom 30 percent are enrolled in two-year degree programs, 53 percent in bachelor's degree programs, and 17 percent in advanced degree programs. These low-scoring students have the following characteristics:

43 percent men, 57 percent women
55 percent minorities
15 percent limited English proficient (LEP)
24 percent not born in the United States (9 percent immigrated within the past five years)
Average age 26.6
88 percent live in a metropolitan area
25 percent live in households at or near the poverty level

If we focus on just postsecondary students scoring at Level 1 on one or more of the literacy scales, we find even higher concentrations of minority, immigrant, poor, and LEP students. The approximately 474,000 academic postsecondary students scoring at Level 1 on one or more of the proficiency scales have the following characteristics:

59 percent men, 41 percent women
81 percent minorities
42 percent LEP
42 percent not born in the United States (23 percent immigrated within the past five years)
Average age 27.7
90 percent live in a metropolitan area
29 percent live in households at or near the poverty level

To impart some idea of how the literacy skills of postsecondary students influence their progress through the postsecondary system, I will compare the proficiencies of three groups of adults having a slightly different relationship to given levels of postsecondary education. Figure 4.5 displays, for each level of postsecondary education, the mean NALS literacy proficiencies of three groups of adults: currently enrolled students working toward the given degree (group A), adults who are not currently students who have attained the given degree (group B), and currently enrolled students who have attained the given degree and are continuing their studies (group C). These three groups are arranged from left to right within each cluster of bars in the figure. The figure shows a clear pattern among these groups across the various levels of postsecondary education. Overall literacy scores increase in each group as we move across progressively higher levels of postsecondary education.11

The effects of literacy development and literacy selection can be seen in the consistent patterning of the three groups' scores at each educational level in the figure. Postsecondary students working toward a given degree (group A) have lower scores than adults who are no longer students but previously attained that degree (group B). Group A is lower than group B because group A includes some postsecondary students whose skills may preclude them from attaining the degree that group B has already attained (literacy selection) and because some additional skill growth may take place as they complete their target degree (literacy development). The literacy scores of group B are in turn lower than those of group C, whose members are postsecondary students who have already attained the given degree and are currently working toward a higher level (group C). Again, this pattern is expected because of the effects of both literacy development (students in group C have taken additional education beyond the given degree level) and literacy selection (some group C students have been self-selected or institutionally selected for a higher-level degree program).

These clear-cut patterns offer further evidence that the literacy skills and knowledge assessed by the NALS are relevant to student success within

the postsecondary system. Of course, the other factors described in the introduction also influence postsecondary outcomes (Berkner, Cuccaro-Alamin, & McCormick, 1996; Horn, 1996), and basic skills besides those assessed by NALS are needed for success in college (Baldwin, Kirsch, Rock, & Yamamoto, 1995; Barton & Lapointe, 1995; Pascarella & Terenzini, 1991).

LITERACY PROFICIENCIES OF GED RECIPIENTS IN POSTSECONDARY EDUCATION. Because most adult literacy students who enroll in postsecondary education qualify for admission by passing the GED tests, the literacy skills of GED recipients who later become postsecondary students are of particular interest. According to Baldwin (1995), the NALS literacy proficiencies of these recipients appear equivalent to those of adults who attained a high school diploma (but went no further). This may not imply, however, that GED recipients' basic skills are on a par with those who finished high school and chose to continue with their education. Unfortunately, national surveys of postsecondary students usually sample only a small number of students who received GEDs, and test scores (for example, SAT or ACT admissions tests) are typically available for only a small fraction of this already small subsample. As a result, there are usually too few data to investigate this issue directly. A comparison study of the GED and NALS scores among a representative set of GED examinees surveyed by Baldwin and colleagues (1995) does provide some useful information on this point, however.

In the NALS-GED comparison study, a representative sample of all GED examinees during a one-year period was selected to participate in the study and complete the GED tests planned anyway as well as the NALS literacy assessment and a background questionnaire (Baldwin, Kirsch, Rock, & Yamamoto, 1995). The concurrent administration of the NALS and GED instruments to a large representative sample provided analysts with data needed to cross-validate the two assessments psychometrically. They found that the two assessments measured many similar skills (such as reading and general problem solving) as well as a unique set of abilities (for example, the GED tests included writing assessment, whereas the NALS assessed familiarity with and proficiency at manipulating documents common in everyday adult life).

Figure 4.6 depicts the mean NALS literacy proficiencies of three groups. The first group, represented by the leftmost bar in each cluster of bars in the figure, contains all GED examinees who passed the GED tests, regardless of whether they planned to enter postsecondary education. The second group, represented by the middle bar in each cluster, contains GED examinees who both passed the GED tests and planned (at the time of GED testing) to continue with postsecondary education. The third

group, represented by the rightmost bar in each cluster, is the currently enrolled postsecondary students within NALS. The first two groups are taken from the GED-NALS Comparison Study (Baldwin, Kirsch, Rock, & Yamamoto, 1995), and the third group comes from the original NALS study (Kirsch, Jungeblut, Jenkins, & Kolstad, 1993).

The three clusters shown in Figure 4.6 display the mean prose, document, and quantitative literacy skills for the three groups of potential and enrolled postsecondary students. Clearly the overall group of enrolled postsecondary students has substantially higher average levels of proficiency than the GED groups. This is not particularly surprising, since the currently enrolled group includes students who have completed a range of postsecondary education and degrees, whereas the GED passer groups have not yet started any postsecondary education. Notice that the GED groups seem to have somewhat less well-developed quantitative literacy skills.

To explore this comparison further, these data were disaggregated by the level of postsecondary education that currently enrolled students and GED passers planning to enroll expected to complete. These data are shown in Figure 4.7. At each level of degree expected, two bars are shown: the left bars show the combined literacy proficiency of currently enrolled postsecondary students expecting to receive the given degree; the right bars show the corresponding average proficiency for GED passers expecting to enroll in and receive the given degree.

There is only a slight upward trend in proficiency scores among GED passers across increasing levels of degree expected. Among currently enrolled postsecondary students, a much steeper proficiency slope is evident across these levels of degrees anticipated. All groups (with the exception of currently enrolled students in certificate programs) have mean proficiencies above the Level 3 threshold of 275. The fact that recent GED passers intending to continue with postsecondary education show relatively flat levels of proficiency across degrees expected should not be particularly surprising; unlike the currently enrolled students, they have not yet participated in the postsecondary system and its processes of literacy development and literacy selection. Perhaps these potential postsecondary students do not yet have sufficient contact with and information about postsecondary programs and the additional skills they may need to participate in them.

REMEDIAL EDUCATION FOR POSTSECONDARY STUDENTS

Recent surveys make it clear that many postsecondary students participate in basic skills training within their postsecondary institutions, in courses or programs usually labeled remedial or developmental education. These surveys have been conducted using representative

samples of institutions and students at several levels of postsecondary instruction. Somewhat different pictures emerge depending on whether data are reported directly by individually sampled students or by administrators reporting aggregate data for their institutions. We will look first at data from institutional sources, then consider data reported by representative samples of individual postsecondary students.

Institutionally Reported Prevalence of Remedial Education

Lewis and Farris (1996), who described the National Survey on Remedial Education in Higher Education Institutions conducted in 1995, reported that 78 percent of institutions of higher education that enroll freshmen offered at least one remedial reading, writing, or mathematics course in fall 1995. Remedial courses were particularly common at public two-year institutions (100 percent) and institutions with high minority enrollments (94 percent).

Similar prevalence rates for remedial education have been estimated using institutional data in the federal Integrated Postsecondary Education Data System (IPEDS). IPEDS indicates, for example, that 79 percent of institutions of higher education offered remedial courses during the 1993ñ1994 academic year (U.S. Department of Education, 1994).

Institutions reported an average of 29 percent of their first-time freshmen enrolled in at least one remedial course. Higher remedial enrollments and lower remedial pass rates were reported by public two-year and high-minority enrollment institutions. Overall, about 75 percent of students enrolled in remedial courses successfully completed or passed those courses (Lewis & Farris, 1996).

Individually Reported Prevalence of Remedial Education

Estimates of the percentage of students taking remedial courses vary widely depending on whether individual students or their institutions report. Self-report by students yields substantially lower rates of participation in remedial courses. Whereas the institutional survey by Lewis and Farris (1996) reported that 29 percent of first-time freshmen were enrolled in one or more remedial courses, much lower participation rates are reported in surveys where students respond directly. The reasons for this discrepancy are not entirely clear. One possibility is that survey responses by administrators tend to be based on indirect information or on perceptions of the extent to which students "need" or are referred to remedial classes as opposed to direct counts of students enrolled in specific remedial courses. Another possibility is that students are reluctant to report taking remedial courses because of shame or embarrassment.12

Analyzing data from a direct survey of undergraduate students, the

American Council on Education (1996) reported that about 13 percent of undergraduates took one or more remedial reading, writing, or math courses during the 1992ñ1993 academic year. Percentages for minority students were higher: 19 percent of African American, Hispanic, and Asian undergraduates and 15 percent of American Indian students took at least one remedial course, compared with 11 percent of white undergraduates. Neither the immediate degree goals nor the long-term educational goals of students taking developmental courses differed appreciably from those of other students. The two groups pursued similar majors as well.13

Horn and Berktold (1998), analyzing data from the National Postsecondary Student Aid Study (NPSAS), found a similar percentage (12 percent) of undergraduates in their first or second year of college who reported taking at least one remedial course during the 1995ñ 1996 school year. Among students taking at least one such course, 70 percent took a remedial math course, 41 percent a remedial writing course, and 39 percent a remedial reading course. Younger students and those in two-year institutions were most likely to take remedial courses. In two-year and four-year institutions, 14 percent and 10 percent of undergraduates, respectively, took remedial courses during their first two years of college.

More detailed information is available from the Beginning Postsecondary Student (BPS) survey conducted by the National Center for Education Statistics. This longitudinal study followed a randomly sampled cohort of students who enrolled in postsecondary education for the first time during the 1989ñ1990 academic year. The cohort was followed through 1994, regardless of whether individuals stayed at their original institution, transferred to other institutions, dropped or stopped out, completed a degree, worked, and so forth. The BPS data set has particularly rich information about changes in individuals' enrollment and work status, personal and family social and economic contexts, finances, and other factors affecting individuals' decisions about their postsecondary education. The BPS also contains college admission test scores (SAT, ACT) when available, grades, type of high school diploma, and participation in remedial courses.

Analysis of the BPS data indicates that about 15 percent of beginning postsecondary students took one or more remedial courses sometime during their first two years. This represents about 387,000 basic skills students among the 2.5 million students who began their postsecondary education in a given year. The percentages for students beginning in four-year, two-year, and certificate programs are, respectively, 15 percent, 18 percent, and 9 percent. Figure 4.8 displays the percentage of beginning postsecondary students who took various types of remedial

courses: math, reading, writing, and study skills. Consistent with other studies, remedial math is the developmental course most often taken: More than 8 percent of beginning postsecondary students take a remedial math course.

Figure 4.9 displays the overall percentage, by institutional type, of beginning undergraduates who took one or more remedial courses. Consistent with other research reviewed above, the highest incidence of developmental education occurs in public institutions, with public two-year institutions having slightly higher rates (18 percent) than public four-year institutions (16 percent). Private institutions have rates in the 10 to 11 percent range.

Men had slightly higher rates of participation in remedial courses than women: 16 percent versus 15 percent, respectively. Minorities, on the other hand, had considerably higher rates of participation: whereas 11 percent of white students participated in developmental education, 24 percent of black, 19 percent of Hispanic, 24 percent of Asian/Pacific Islander, and 18 percent of American Indian/Alaska Native students took remedial courses. Socioeconomic status (SES) plays a role here as well. Percentile SES ranks were calculated for BPS students from information provided about their personal and family backgrounds. On a 1ñ100 scale, the average SES rank of students who took remedial courses was slightly lower (57) than that of students who did not participate in developmental education (62). Cumulative grade point averages of the two groups were similar: 2.4 for students who had taken remedial courses, 2.5 for students who had not.

Let us compare the overall persistence rates of the two groups. Persistence is defined here as the percentage of students who, five years after beginning their postsecondary education, either had earned a postsecondary degree or were still enrolled in postsecondary education. (Nonpersistence is correspondingly defined as leaving postsecondary education without earning a degree.) The overall persistence rates are 57 percent and 64 percent, respectively, for participants and nonparticipants in developmental education.

Impact of Remedial Courses

The BPS data seem to indicate that postsecondary students who participate in remedial education are faring relatively well compared with their peers who do not participate. Their grades are about equal, and their persistence is nearly as high (which is impressive considering their somewhat lower SES). Another indicator is revealed by comparing the percentage of bachelor's degree recipients who report having taken remedial courses with the percentage of entering postsecondary students who report having taken remedial courses. McCormick and Horn (1996,

p. 107) estimate, using data from the national Baccalaureate and Beyond study, that 10 percent of students who received bachelor's degrees during the 1992ñ1993 academic year reported having taken remedial courses as undergraduates. This percentage can be roughly compared with our BPS finding that 15 percent of all students who began their postsecondary education during the 1989ñ1990 school year took remedial courses during their first two years.

These numbers are not directly comparable, of course, because not all students receiving bachelor's degrees during 1992ñ1993 began their postsecondary education in the same year, let alone during 1989ñ1990. Nor did all beginning students in 1989ñ1990 initially enter or later transfer into four-year institutions. Nevertheless, the fact that 10 percent of students receiving bachelor's degrees had previously received basic skills suggests that developmental programs may well be assisting at least some students to develop the skills needed for academic success.

Despite such hopeful signs, such data provide a very uncertain picture of the impact or effectiveness of developmental programs as interventions to assist underprepared students. As a number of scholars have pointed out, the impact of such programs is exceedingly difficult to evaluate (Astin, 1998; Grubb, 1998). For one thing, we do not know if only those students who least needed remedial education choose to participate. The large gap between participation rates based on institutional reports and student self-reports may well reflect the gap between students judged by their institutions to need better basic skills and those who actually decide to participate in remedial courses. It is possible that students who really need remedial courses tend not to participate. We have little data about changes in students' basic skills and academic performance that can be associated with participation in these courses. Clearly, further research is needed to identify the impact of such programs on students' learning. Nevertheless, all things considered, the nearly comparable overall performance of the remedial students in the BPS data does suggest that the developmental programs are achieving at least a modicum of success. As we will see, other groups of postsecondary students show more obvious signs of academic distress within the same BPS data.

OUTCOMES FOR ADULT EDUCATION STUDENTS IN POSTSECONDARY EDUCATION

If adult education students are to pursue postsecondary education and training successfully after getting GEDs or equivalencies, they must enter programs and then successfully complete them. There is considerable evidence that adult education students neither enter nor complete postsecondary programs at rates comparable with those students earning high school diplomas or even at rates commensurate with their own

expectations stated at the time of GED preparation and testing. This is particularly the case with respect to programs awarding two- or four-year degrees.

There are many reasons that individuals who did not complete high school may later find it difficult to access and complete postsecondary education after obtaining a GED. Many of the life circumstances associated with dropping out of high school may persist into adult life and serve as barriers to further education. Research on postsecondary persistence and attainment finds receipt of a GED or certificate of high school completion to be one of seven risk factors for dropping out of postsecondary education without attaining a degree. The other risk factors predicting persistence/attainment are being older than typical (delayed entry), attending part time, working full time, being financially independent, having dependents, and being a single parent (Berkner, Cuccaro-Alamin, & McCormick, 1996; Horn, 1996).

Boesel, Alsalam, and Smith (1998) reviewed follow-up studies of GED recipients, which for recent years report that 50 to 63 percent of GED recipients get additional postsecondary education or training, most of which occurs in two-year and vocational-technical colleges and most of which is focused on acquiring occupational skills.

Some relevant data are provided by the BPS survey. The first cohort studied by BPS began postsecondary education during the 1989ñ1990 school year. The BPS survey determined the type of high school credentials beginning postsecondary students obtained: high school diploma, GED, or other certificate of high school completion. According to the survey, there were roughly 145,000 GED graduates who began their postsecondary education in 1989ñ1990: 17,000 in four-year, 88,000 in two-year, and 40,000 in less-than-two-year schools. Table 4.4 displays the distribution of secondary credentials held by students beginning three levels of postsecondary institutions: four year (awarding bachelor's degrees), two year (awarding associate's degrees), and less than two year (awarding certificates).

Although nearly 20 percent of students entering certificate programs have a GED or equivalency, much smaller percentages of students beginning postsecondary education in two- or four-year institutions have a GED or equivalency certificate. About 2 percent and 7 percent of students entering four-year and two-year institutions, respectively, have a GED. Since 15 to 20 percent of all high school credentials issued at that time were GEDs, this indicates that relatively few GED recipients go on to postsecondary academic education. This pattern is consistent with research that contrasts the relatively large numbers of adult education students who report planning to pursue college degrees with the small

numbers who actually enter or complete postsecondary academic programs.

Boesel and colleagues (1998) concluded that the grades of GED recipients who do enter postsecondary education are roughly comparable to those of students entering with high school diplomas. GED recipients' grades are initially lower during the first year of enrollment but rise to statistically comparable levels over time (perhaps, as Boesel and colleagues suggest, as the less able GED recipients are weeded out). The GPA ratios of the two groups rise from 0.82 to 1.06 in two-year and 0.86 to 1.00 in four-year colleges.

Some research indicates less persistence and degree completion among GED recipients in colleges than among students with high school diplomas. Boesel and colleagues (1998) argue that this difference is not a causal "result" of GED certification but rather of other long-established predisposing factors such as single-parent status and age-delayed entry. The BPS data can again shed some additional light on these issues.

Table 4.5 contrasts the persistence rates for beginning postsecondary students who enter various levels of institutions with a high school diploma or a GED. Overall, 63 percent of all beginning postsecondary students either attain a degree or are still enrolled and pursuing one five years after entry. The overall rate is much higher for students entering with high school diplomas (65 percent) than with GEDs (40 percent). Interestingly, there is no significant difference between the two groups' persistence rates from certificate (less than two-year) institutions. The highest persistence rates occur among students entering four-year institutions and the lowest rates for students entering two-year institutions. The biggest difference between the persistence rates of the two groups of students occurs in two-year institutions rather than in four-year institutions. It is difficult to determine whether this pattern results from the tendency of four-year schools to be more selective than two-year schools and to deny admission to students at risk (for whatever reason) of not completing programs successfully. This was suggested in Figure 4.7, where we see large differences in skills between GED passers intending to go to four-year schools and those of students currently enrolled in those four-year schools. Perhaps only the more skilled students are admitted (on the basis of college admission test scores, for example).

To explore whether GED recipients in postsecondary education encounter more literacy-related problems than their peers with high school diplomas, I compared the relative experience of the two groups with remedial courses. Figure 4.10 displays the results of this analysis. It is clear that students with the GED are much more likely (22 percent

versus 15 percent) to participate in remedial courses while in postsecondary education. The same pattern is evident for remedial reading, writing, and math courses. Although they have passed the GED tests, designed to certify their mastery of the skills and knowledge that high school graduates bring, the former adult education students may not be as well prepared for postsecondary education as students entering with regular high school diplomas. Additional research is needed to clarify the differences in skill sets that may be involved and to identify other factors that could be contributing to their different postsecondary experiences.

Other factors may be at work here as well. The two groups differ markedly in SES percentile rankings. In sharp contrast with the slight difference noted between the mean SES percentile rankings of postsecondary students who do and do not participate in developmental education, there is a substantial difference between the SES percentiles of the GED and high school diploma groups: 35 versus 63. This difference undoubtedly is partly responsible for the observed differences between the two groups' persistence rates. At the same time, among students who manage to stay in school, SES differences appear not to influence their overall academic performance: the cumulative GPAs of the two groups are both 2.5. Further research is needed to understand better the differential influences of these factors on academic performance and persistence.

IMPLICATIONS FOR THEORY, RESEARCH, POLICY, AND PRACTICE

We have seen that nearly one in four (22 percent) of the nation's college students seeking academic degrees lacks the literacy skills to meet the designated national benchmark for adult literacy. Clearly policy and program design for improving the nation's adult literacy must focus not only on the Kñ12 and adult education systems but on the postsecondary system as well. An extensive set of support programs has emerged in postsecondary institutions for teaching many of the literacy skills that have traditionally been taught in adult basic and secondary education programs. Typically labeled as remedial or developmental education, these postsecondary basic skills programs in a given year serve about 15 percent of students beginning their postsecondary education (there were 387,000 during 1989ñ1990, for example). This number could be up to twice as large if, as some have suggested, students underreport their participation in such courses. There are some promising signs that these developmental courses support successful postsecondary learning outcomes; 10 percent of students nationwide receiving bachelor's degrees reported taking a remedial basic skills course. Given that the standard of living is increasing in our society only for college graduates, the importance of improving the basic skills of postsecondary students seems

clear enough.

Nevertheless, there are major problems to be addressed and important issues that must be resolved in order to provide more effective literacy education for postsecondary students and adults in other settings. First, the broadening of access to postsecondary education and the provision of basic skills courses to college students remain controversial and politically uncertain goals in many venues. The finding that relatively few of the adult literacy students who obtain a GED eventually enroll in postsecondary education (given the large number who express an interest in doing so) is a clear concern. Even more troubling are the findings that the GED holders who do enroll have dramatically lower rates of persistence and completion within postsecondary programs. These data reflect problematic discontinuities between basic skills instruction in the adult education and postsecondary systems, as well as discontinuities between counseling, financial assistance, and other student services provided in the two systems. Such discontinuities impede the longer-term learning trajectories that adults need to follow to acquire both the literacy skills and the postsecondary degrees that they need.

To develop policies and programs that more effectively support learner progress both within and across the adult education and postsecondary education systems, a number of key policy and program issues need attention. Better theory, information, and research about adult learning and education will likely be needed to address these issues. Let us consider some implications of these results for theory and research in adult learning and literacy as well as for improved policy and practice in adult literacy education.

Implications for Policy and Practice

Despite the increasing overlap between the populations of adult education and remedial postsecondary students, surprisingly little attention has been given to developing systematic programmatic and policy bridges between the two systems. Previous reviews of policy and practice issues in adult literacy education (see, for example, Beder, 1991; Sticht, 1998; Venezky & Wagner, 1996) have not addressed the linkages between adult education and postsecondary education. Five-year state plans developed thus far for implementing the Workforce Investment Act (WIA) of 1998 have either totally overlooked coordination between adult education and remedial postsecondary education or paid scant lip-service to it. This is surprising, given that the WIA regulations recognize transition into postsecondary education as a positive outcome and require explicit coordination between adult literacy training and other services. Although there are some interesting programmatic exceptions (some noted below), the need to forge such linkages apparently has not yet been widely perceived.

Following are some recommendations on policy and programmatic issues that need careful attention:

Support learning paths from adult education into postsecondary education. It is clear that long-term increases in adults' literacy proficiencies will require developing more effective educational programs at all levels: Kñ12, adult education, postsecondary education, and workplace education. Given the increasingly intertwined pathways of adult education, postsecondary education, and work, more coordination in the design and implementation of basic skills programs across these sectors is needed.

Although many policymakers focus on addressing future needs through Kñ12 or even Kñ16 educational reforms, such changes will not help older and returning students in need of better skills and more education. We will be unable to meet the national education goal or provide the skills that adults need to move out of poverty if we do not create more easily traversed pathways from adult education into postsecondary education. In particular, there must be more effective types of counseling as well as financial and academic support for GED students and recipients wishing to go on for postsecondary degrees. Better transition support, delivered in a learner-centered fashion, could reduce the burden carried by learners, who already face enough difficulties, in navigating and integrating a highly fragmented and complex system.

Advance the goal of adult education from high school equivalency to college preparation. Too many students who obtain a GED or other equivalency certification apparently are not sufficiently well prepared to succeed in college. The discontinuities between adult and postsecondary education appear to be barriers to their success. Although not all adult education students may wish or choose to go to college, a more seamless learner-centered system is needed for those who do. Yet why should the target of adult education programs be high school completion rather than college readiness? There are important issues to resolve in forging such bridge programs. Where should they be located (primarily on campuses, for example, or primarily in separate locations), how should they be financed (through federal adult education funds, for example, or through tuition dollars), and who should teach these programs?14

Make postsecondary and adult education teachers and administrators more familiar with each other's programs. There are many compelling reasons for practitioners in developmental secondary education and adult education to familiarize themselves with each other's programs. These are the educators who must design and build the bridges across the current gaps between the two systems. In most cases, the systems operate independently of each other, even on campuses where both remedial

postsecondary and adult education classes are offered.15

As literacy educators working in one of the settings become more familiar with the learners, instructional models, resources, and problems of programs in the other setting, they will be better prepared to design and implement more effective bridges between programs. There are currently both important similarities and differences between these programs. Grubb and Kalman (1994) describe the variety of remedial programs in subbaccalaureate institutions (especially community colleges) and point out similarities between developmental education in these institutions and other forms of adult basic skills education, such as high rates of attrition and apparent low levels of student motivation. Other common issues can be seen as well: low and uncertain levels of program funding; rumors of ineffectiveness; teacher issues, including lack of certification and reliance on part-time rather than full-time personnel; the marginality of learners, teachers, and programs; and poorly defined articulation with other programs.

There are other features that differentiate the two types of programs and keep them apart. College students taking remedial basic skills courses, for example, generally pay tuition for these classes but do not receive degree credit for them, whereas students in federally funded adult education courses receive similar instruction and assistance free of charge.

Encourage closer linkages between practitioners and professional organizations in adult education and developmental education. Practitioners currently working in the two types of programs generally belong to distinct professional organizations, have different professional identities, attend separate conferences, and read different journals. It would be helpful if these organizations jointly sponsored professional development activities and occasional publications directed to both memberships. Such joint activities could be a productive way to forge closer linkages between these two largely separate worlds of practice that find themselves serving increasingly overlapping populations of learners. More effective sharing of resources, instructional strategies and materials, and problem-solving techniques will benefit everyone, especially the students desiring more seamless learning paths leading from adult education to postsecondary education.

Share expertise across programs and settings on adult learning and literacy development. To a considerable extent, practitioners in the two settings have developed complementary expertise and approaches to adult literacy education. Adult educators have a great deal of experience with outreach and delivery models that relate to diverse individual learner goals and contexts. Instructional models have been developed

specifically for delivery in workplace and family settings, for example. A range of contextualized or "functional context" models has emerged that draw on the interests, needs, and goals of individual adult learners (Sticht, 1998). These adult education models attempt to build linkages between basic skills instruction and other personal, work, family, and community contexts of interest to learners.

Developmental educators in postsecondary programs, on the other hand, have tried to create models that build contextual linkages between basic skills instruction and other academic content areas and courses. A variety of these embedded (rather than detached) models of remedial basic skills instruction have emerged. The supplementary instruction model (Martin & Arendale, 1998; Ramirez, 1997), the adjunct course model (Commander & Stratton, 1998), and the package course model (Wilcox, delMas, Stewart, Johnson, & Ghere, 1997), for example, are different approaches to linking developmental education with specific academic courses.

Thus there are models available in each domain that can be valuable resources for practitioners who are trying to bridge these two worlds of basic skills education. Important pedagogical principles shared by educators in the two domains can inform the design and implementation of these bridge programs. The central importance of learning communities, for example, is emphasized by theorists in both camps (see, for example, Street, 1995, and Tinto, 1998). The concepts of critical thinking (for example, Chaffee, 1998, and Sticht, 1998) and contextualized learning are also widely shared.

Develop better techniques for assessing the relative cost-effectiveness of different program models. There is growing need in both adult education and developmental postsecondary education to assess the impact of instructional programs on learner outcomes. Analysts have looked closely at both adult education programs (Sticht, 1998) and remedial secondary programs (Astin, 1998; Grubb, 1998) and have concluded that current data collection efforts and program evaluation methods cannot provide reliable measures of program impact on participants' basic skill gains or on other workplace or higher education outcomes. A renewed commitment to addressing the difficult assessment and program evaluation issues involved is needed.

Closely coordinate state policy and law with federal policy and initiatives. Lewis and Farris (1996), using data from the National Survey on Remedial Education in Higher Education Institutions conducted in 1995, reported that state laws or policies affect remedial offerings in about one-third of the postsecondary institutions. Typically such policies either require or encourage institutions to offer remedial education.

About one in four institutions reported time limits on remedial course offerings set by either institutional policy or state policy or law. Many institutions experience external directives restricting their ability to design and implement remedial programs effectively. Conflicts arise frequently between institutional practice, state law or policy, and federal policy and initiatives in developmental education.

One issue that has not yet received much attention concerns the huge financial stakes involved with accreditation, tuition, and student financial aid as related to developmental education. Under current law and regulations, students matriculated in academic programs are eligible for Pell grants and student loans and pay tuition dollars for any remedial courses they take, but they receive no credit toward a degree for these courses. If the same students were to take basic skills courses through federally funded adult education programs, they would pay no tuition and again receive no degree credit for those courses. There are thus high financial stakes involved in changes in state policy affecting remedial education. When state university systems, for example, are discouraged from offering remedial education, many institutions can be heavily affected in financial terms as programs and students move to other institutions, such as community colleges or proprietary schools. To get a sense of scale, consider these examples reported by the American Council on Education (1996):

- In Florida, 70 percent of incoming community college students in 1993ñ1994 needed remedial courses, costing $53 million.
- Texas, which has one hundred two-year and four-year schools, pays an annual tab of $60 million for remedial programs.
- California State University trustees adopted a new policy in January 1996 to cut back on remedial courses costing $10 million at twenty-two campuses.

Clearly neither the students nor the public institutions involved in remedial education will be indifferent to the huge financial implications of changes in state and federal policies. The financial implications of moving large numbers of adult literacy learners (along with their tuition dollars, grants, and loans) among institutions and programs must be carefully considered as educators and policymakers strive to develop improved policies and program designs.

Attend to diversity and equity concerns. Basic skill issues are closely connected to a range of societal racial, ethnic, linguistic, and gender diversity issues. This is the case for both adult education and developmental education in postsecondary institutions. Ongoing and proposed cutbacks in remedial education will certainly have a

disproportionate impact on poor and minority students. Jencks and Phillips (1998) make a strong case that when socioeconomic or basic skills differences among students are equated, race-based inequities in the eventual college completion rates of high school students disappear. Since a college education is becoming increasingly less affordable for many poor and minority students, it becomes all the more important to retain strong support for basic skills programs.

Implications for Theory and Research

Resolving many of the policy and program issues will require additional research in adult learning, adult literacy education, and postsecondary education. There are a number of topics for which further research and better theory would be particularly helpful:

Role of literacy proficiency and high school experience in entrance into and persisting in postsecondary education and lifelong learning activities. There is a growing research literature on the factors that influence students' and adults' decisions about continuing and/or returning to school for postsecondary education and about how postsecondary students manage concurrent responsibilities at work and at home. Better data are needed about these issues among adults who obtain nontraditional high school credentials such as the GED. Unfortunately, the low rates of GED recipients' subsequent enrollment in postsecondary education usually mean that there is too small a subsample of GED recipients in college within these follow-up studies to portray adequately their experiences and the unique problems they face. This makes it harder, of course, to understand the distinctive types of support that could positively influence their postsecondary experiences. In the future, it would be helpful if such studies could oversample postsecondary students with GEDs.

Interaction between literacy selection and literacy development processes within postsecondary education. There is considerable evidence in postsecondary education of both literacy development processes (through which students' literacy abilities increase) and literacy selection processes (through which students' literacy abilities weed them out of particular institutions, programs, and classes). There are many correlated characteristics at the student and institutional levels (Zemsky, 1998, in preparation; Zemsky, Shaman, & Ianozzi, 1997). The tight correlations between characteristics such as student abilities and institutional prestige are particularly difficult to interpret because they confound literacy selection and development processes happening within the postsecondary system. Improved design of developmental education will likely require an improved capacity to distinguish outcomes attributable to literacy selection versus literacy development processes at these various levels.

Transfer of learning between workplace and educational settings. The fact that a preponderance of postsecondary students concurrently work and attend school suggests that we need to understand better the factors determining how learning in one context or role influences learning and performance in the other. Ongoing efforts to restructure workplaces into learning organizations as well as efforts to restructure postsecondary institutions to fit better with workplaces will be much more effective if we understand the similarities in and differences between learning in the two contexts.

Skill gains produced by literacy education in postsecondary institutions. New research is needed to provide more direct evidence about students' skill gains resulting from various types of classes and programs supporting literacy development. There are insufficient data to allow experts to answer basic questions about what students learn in college and how such learning addresses the needs of the workplace and of adult life in general (Astin, 1998; Boylan, Bliss, & Bonham, 1997; Grubb, 1998). One promising point of departure may be to look at the distinctive characteristics and experiences of the 10 percent of bachelor of arts degree recipients who reported taking remedial courses compared with those of less academically successful students in remedial courses.

Development of literacy practices in postsecondary settings. Much of the large-scale research done on literacy education in postsecondary settings has relied extensively on standardized measures of literacy proficiency such as those drawn on in this chapter. But much student literacy development may be better understood not only through such test scores but also through detailed descriptions and analyses of how students engage in (and are sometimes excluded from access to) particular kinds of literacy practices valued by the institutions (Howard & Obetz, 1998; Hull, 1998; Smith, 1998)-for example, writing essays; searching for, compiling, and citing relevant articles for a research paper; and solving chemistry problems on an exam. Rather than investigating how best to raise students' literacy scores, a more useful question may be how to build their engagement in such literacy practices (Reder, 1994).

Follow-up studies with literacy assessments of postsecondary students. The design of improved policies and programs must be based on the results of longer-term follow-up studies of postsecondary students that include assessments of literacy skills and practices at multiple time points during and after students' postsecondary education. These studies could also assess the impact of literacy development during college on lifelong learning practices, including the use of technology and subsequent participation in continuing education, additional postsecondary education, and technical training. Existing national longitudinal studies, such as the Beginning Postsecondary Student survey

or Baccalaureate and Beyond, could be used for this purpose, but their authors would need to lengthen their follow-up periods considerably and include many more students entering college with low literacy proficiencies.

Differential influences of social and economic circumstances on postsecondary persistence and performance. Further research is needed to understand better the differential interactions of social and economic factors on academic performance and persistence. The existing research base has identified a set of seven risk factors that influence persistence and attainment. One of these factors is having a GED or other nontraditional high school credential. Since we are interested in developing effective programs and policies for this particular at-risk group, it is essential to investigate how the other risk factors interact in influencing their postsecondary outcomes.

Notes

1. These "proprietary" schools typically offer certificates of completion for specific courses of study in given occupations, trades, or businesses.
2. Mean earnings for adults age eighteen and over with education, taken from U.S. Census Bureau, Current Population Survey, Educational Attainment in the United States: March 1998 (Update), Table 9 (p. 51).
3. Although the NALS assessed three scales of literacy (prose, document, and quantitative), the results of interest here are very similar for each of the three scales, so a single combined measure that averages performance across the three scales is shown in this figure for brevity (see Reder, 1998b).
4. There is a substantial amount of missing data affecting these estimates. Among the national sample of 22,548 participants entering programs between April 1, 1991, and March 31, 1992, data were missing on highest degree and/or nativity from 3,532 (15.7 percent) of the cases. Most of these data were missing because a second program intake form designed for the NEAEP was not completed. Despite the potential bias produced by these missing data (Cohen, Garet, & Condelli, 1995), it is clear that a substantial number of adult literacy students have U.S. high school diplomas or higher degrees.
5. Concurrent participation in postsecondary education was not asked in the NEAEP survey.
6. The subsample size for this identified group of postsecondary students within NALS is 2,254.
7. Since the CPS education supplement includes only individuals

under thirty-five years of age, the CPS estimates were inflated by NALS-derived ratios of the total postsecondary student population over the subpopulation under thirty-five years of age. These adjustments were performed separately for the undergraduate and graduate populations.

8. CPS data were not used here because the data excluded students thirty-five years of age and older.
9. Elsewhere (1998b) I suggest the use of the combined scale in some circumstances because of the high degree of intercorrelation among
the assessed prose, document, and quantitative proficiencies.
10. The subsample size for this subgroup of postsecondary students within NALS is 1,977.
11. For simplicity, this figure shows only the combined literacy score (the average of the prose, document, and quantitative scores). Table 4.3 indicates that this combined measure will probably behave the same way as the three literacy scale measures. See Reder (1998b) for further details.
12. Another explanation was suggested by a reviewer of this chapter: students underreport participation in remedial courses because they do not realize that some of the courses they took (such as "Basic Math") were in fact remedial. This seems unlikely, though; most students know that particular courses are remedial because they must pay tuition for them but do not receive credit toward a degree for them.
13. Students taking remedial math courses were more likely to major in health-related fields than their peers who did not take any remedial classes (see American Council on Education, 1996).
14. There are examples of such bridge programs that can be resources for developing new policy and program designs. Delaware, for example, has some bridge models of college prep programs, as do participating unions in the Consortium for Worker Education in New York City.
15. In states where the community college system is the delivery system for federally funded adult education, both adult education classes (offered free of charge to students) and remedial postsecondary classes (for which students pay tuition but receive no credit toward a degree) are generally offered on the same campus. Even in such cases the two systems usually operate independently, with separate budgets, staff, and student services. There are some notable exceptions that can serve as models or resources for developing new policies and program designs. At North Iowa Area Community College in Mason City, for example, many functions and services are merged across the two programs.

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Chapter 5