CHAPTER 6 IS ADULT BASIC EDUCATION WORTH THE INVESTMENT?

THE ADULT BASIC EDUCATION SYSTEM educates a tiny fraction of the adults who need stronger skills. Before increasing the system's capacity, we should ask what return we get from an investment in ABE. Specifically, the question that must be answered is this: Does participation in adult basic education programs lead to positive outcomes? For the first time in the history of ABE in Massachusetts, because of recent improvements in data collection, we are able to conduct a comprehensive quantitative analysis of whether the money the state spends makes a difference in our ability to teach basic skills to adults. In an in-depth analysis of 1998 Department of Education data, we test for the effectiveness of ABE programs in a number of ways. We examine the learning gains of participants and then look at the learning gains in relation to the number of hours of instruction. We next estimate the probability that participants in ABE programs will earn a high school credential or find a job. We end by considering the broader range of outcomes that students achieve. Participation does lead to positive outcomes in all of these categories, but there is considerable room for improvement, and the state should focus on increasing the effectiveness of adult basic education. In addition, we have some concerns about the quality and limitations of the data available and offer suggestions for improvement.

Review of the Effectiveness of Adult Basic Education Nationally

Measuring the effectiveness of adult basic education is difficult, and unfortunately, there is no large body of reliable information on the topic. This section, which draws heavily on the work of Rutgers University Professor Hal Beder, offers an overview of what we know about the effectiveness of adult literacy education.[1]

Hal Beder investigated the outcomes and impacts of adult literacy education by analyzing 115 studies since the late 1960s. Beder selected twenty-three studies—which include national studies and studies of specific adult literacy programs across the country—as the most credible. From these case studies, he draws general conclusions about the effectiveness of adult literacy programs.

Beder examines a range of possible outcomes and finds that participants in adult literacy programs experience positive gains, although sometimes the gains are quite small, and his findings are far from conclusive. In terms of employment, he finds that these students in programs are more likely to find jobs. However, most of the studies reporting employment gains were based on self-reports and lacked comparison or control groups. Thus, we cannot infer whether these gains were caused by participation in adult literacy programs, by macroeconomic factors, or by other factors. Beder does find that, of the six studies that measured impact on earnings, five reported that participation in adult literacy programs led to increased earnings. In a separate study on workplace education programs, Kevin Hollenbeck finds a wage gain of 19 percent for male participants using one national data set and a wage gain of 14 percent for female participants using another national data set.[2] Participants believed that their jobs improved over time, although there is insufficient evidence to conclude that their participation in adult basic education contributed to that improvement.

The overwhelming majority of studies that asked participants whether they had improved their reading, writing, and math skills found that students perceive gains in these subjects. When measured by tests, however, the gains, were ambiguous, which raised a host of questions about test validity, attrition between pre-program and post-program testing, and other measurement issues. The studies did find that students at the more advanced levels are likely to obtain a GED.

Eleven studies measured the impact of adults' participation on the education of their children—asking whether a parent's increased skills had an effect on

1 Hal Beder, "The Outcomes and Impacts of Adult Literacy Education in the United States" (The National Center for the Study of Adult Learning and Literacy (NCSALL) Report 6, Harvard Graduate School of Education, Cambridge: January 1999). See also Mary Moore and Michael Stavrianos, "Review of Adult Education Programs and Their Effectiveness: A Background Paper for Reauthorization of the Adult Education Act" (Washington, D.C.: Mathematica Policy Research, Inc., August 1995).

2 Kevin Hollenbeck, "A Framework for Assessing the Economic Benefits and Costs of Workplace Literacy Training" (Kalamazoo, Mich.: W.E. Upjohn Institute for Employment Research, 1996).

his children. Eight found that participation in adult literacy had positive effects, two studies were inconclusive, and one study found negative effects. For the individual adult, participation appears to have a positive impact on participants' self-image, and these gains are quite large.

Beder analyzes twenty-three of the most credible studies. Yet he still finds flaws that raise some questions about the validity and utility of the findings in all of them. Clearly, the quality and volume of information must improve in order to assess fully the effectiveness of adult literacy programs.[3] Nonetheless, if we put the findings of all the studies together, they suggest that adult basic education has a positive impact on its participants. This is an appropriate prelude to the following discussion about the effectiveness of adult basic education in Massachusetts and the problems with data collection here in the Commonwealth.

In-Depth Analysis of 1998 Massachusetts Data

To assess the effectiveness of adult basic education in the Commonwealth, we set out to answer a simple but crucial question: Does participation in ABE programs lead to positive outcomes? Using 1998 Department of Education data, we looked at this question in four different ways. We examined:

1) learning gains
2) number of hours of instruction
3) probability of earning a GED or alternative high school credential
4) probability of finding a job

We analyzed the Fiscal Year 1998 data for approximately 19,800 participants in adult basic education programs across the Commonwealth.[4] Because of the way data are collected, these learning gains are only the reported gains that took place during the fiscal year from July 1, 1997 to June 30, 1998. This limitation means that we know nothing about gains that students achieved after this date. It is reasonable to assume that there were gains after the end of the fiscal year, since the endpoint is arbitrary from the perspective of the student, but we currently have no way of measuring those gains. Thus, we believe that if the learning gains were measured over a longer period of time, they would be greater. According to Robert Bickerton, the director of adult basic education for Massachusetts, when SMARTT, the Department's database, is fully implemented within the next few years, longitudinal data will be available, and we will then be able to assess a participant's learning gains over time.

Measuring the impact of services is critical if we hope to hold the adult basic education system accountable and determine the value of the state's investment. The type and quality of data collected are crucial to analyzing the impact of services. While the Department has improved the quantity and quality of data, more work remains to be done, and further improvement of data quality is among the most important recommendations of this report.

Learning Gains

Students attend classes to learn. Do they learn? When students enter adult basic education programs, they are tested or assessed in other ways to determine their starting level; they are also tested when they leave a class or at the end of the fiscal year. By comparing the entry and exit levels for all students within a fiscal year, we can gain an overall sense of the effect of participation in programs. Table 6.1 shows the percentage of ABE students at each grade level when they enter the programs and then the levels for the same group of students when they exit the program.[5]

TABLE 6.1
The Level of ABE Students upon Entry to and Exit from a Program*

Grade Level	Percent of Students at Level on Entry or Beginning of Fiscal Year**	Percent of Students at Level on Exit or End of Fiscal Year**
0	1.7	0.6
1	2.6	1.2
2	3.3	1.9
3	5.7	4.1
4	7.8	5.6
5	9.9	8.1
6	12.5	9.3
7	9.4	9.0
8	11.0	11.1
9	14.1	11.8
10	11.2	12.8
11	5.3	8.5
12	5.6	16.0

** ABE includes basic literacy, Pre-ASE, and ASE/GED.*
***n = 9,572*

The students who come to the door of ABE pro-

3 For a further discussion of measurement difficulties, see also United States General Accounting Office, "Adult Education: Measuring Program Results Has Been Challenging," GAO/HEHS-95-153, September, 1995.

4 The System for Managing Accountability and Results Through Technology (SMARTT) has provided the first opportunity in the history of ABE in Massachusetts to conduct a quantitative analysis of participant outcomes. While the quality of the Fiscal Year 1998 student, teacher, classroom, and site data is not yet optimal, due to a series of system design and data entry issues, the data contain a sufficient number of valid cases for the analysis of outcomes. A comparison of our sample with the sample used by the Mass. Department of Education in its federal statistical reports indicates that the students in our sample did not differ in any significant respects, and the minor differences we found did not alter the main findings of the analysis of this chapter.

5 ABE consists of Basic Literacy, Pre-ASE (Adult Secondary Education), and ASE/GED classes. These classes are for native English speakers or for immigrants who are fluent in English. Basic Literacy is a beginning literacy class. Pre-ASE is an intermediate class. ASE (Adult Secondary Education) is the most advanced class, and it prepares the student to take the GED test. ESOL classes teach English to speakers of other languages.

grams clearly need help upgrading their skills. About three-quarters begin their studies at or below the ninth grade level. Almost a third entered at the fifth grade level or below. Is the system able to help them learn? It appears so. While a small number of students decreased one or more levels and others stayed at the same level (see Table 6.4), in the aggregate, there appears to be an upward movement. By the time the students exit the programs—either because they achieved their goal, they dropped out of the class, or the fiscal year ended—there are fewer students at the lower and intermediate levels and more at the advanced levels. The number below the fifth grade level dropped by 10 percentage points, and the number of students at the highest level almost tripled from 5.6 percent to 16 percent. At the end of 1998, the average grade-level equivalent forABE students was 8.1.

Table 6.2 shows the same information, measured by student performance levels (SPL), for students enrolled in ESOL classes in 1998.

ESOL students also enter the system in need of instruction. More than half enter at a beginning level (SPL 0-4), and more than 90 percent enter at a beginning or intermediate level (SPL 5-6). At the time of exit, there has been an upward movement. The number of students at the beginning level dropped 15 percentage points to 54.6 percent. The number of students at the lowest level dropped 10 percentage points. At the other end of the spectrum, the number of students at the advanced level (SPL 7-10) doubled from 8.2 percent to 16.4 percent, but the number of students at the highest levels is still relatively small. This seems to suggest that students reach a plateau in their learning, or they leave the classroom before reaching advanced levels. Perhaps some students leave, because they have met their goals. At the end of 1998, the average student performance level for ESOL students was 4.1.

The learning gains that students achieve vary, depending on the level and type of class they attend.[6] Within ESOL, the smallest gains were in Advanced ESOL classes, where the average gain was .48 SPL level. The largest gains were 1.38 SPL levels in Beginning ESOL classes. The same pattern is true in ABE classes. The largest gains in ABE programs were in the beginning adult literacy classes, where the average gain was 1.52 grade level and the smallest gains were in GED at .58 grade levels (Table 6.3). Students who enter at lower levels achieve greater learning gains than students who enter with stronger skills.

Most students achieve learning gains (Table 6.4). In a short period of time, 11,755 students learned enough to advance a grade or SPL level. Indeed, 56 percent of students in ABE programs gained at least one grade level, and 63 percent of students in ESOL classes gained at least one SPL level. Approximately 30 percent of ABE students gained at least two grade levels and a comparable proportion of ESOL students gained at least two SPLs. Within one year, almost 3,000 students achieved learning gains of three or more levels.

TABLE 6.2

The Level of ESOL Students Upon Entry To and Exit From a Program

Student Performance Level	Percent of Students at Level on Entry or Begining of Fiscal Year*	Percent of Students at Level on Exit or End of Fiscal Year*
0	13.1	3.2
1	19.4	10.2
2	14.5	13.1
3	13.2	14.8
4	9.8	13.3
5	15.4	15.2
6	6.4	13.8
7	5.5	9.3
8	2.0	4.1
9	0.3	1.6
10	0.4	1.4

** n = 10,132*

TABLE 6.3

Average Learning Gains for ABE Students and for ESOL Students [7]

Program/Service Type	N	Average Learning Gain*
Adult Literacy (Beginning ABE)	2,965	1.52
Pre–ASE (Intermediate ABE)	3,142	1.21
ASE/GED	3,465	0.58
Beginning ESOL	7,096	1.38
Intermediate ESOL	2,208	0.68
Advanced ESOL	828	0.48

* Learning gains in literacy classes are measured in grade levels. Learning gains in ESOL classes are measured in student performance levels.

6 When tested, the gains in all categories were statistically significant. Large standard deviations, however, suggest that there was great variation in individual gains.

7 Students were classified using the level that they were assessed at upon entry, not based on the level of class that they attended. Classification based on first class attended may not accurately represent the students' levels, because students often attend classes that have space available even if they are more or less advanced than the student's level. For instance, beginning ESOL students may be placed in an intermediate class because no beginning class is available. Individuals interested in additional statistics can request these from the authors.

TABLE 6.4

Number and Percentage of Students who Achieve Learning Gains

Program Type	Number of Students who Achieved Outcome	Percent of Students who Achieved Outcome
ABE/PRE-ASE/GED		
Decreased a Level	409	4.3
Stayed the Same	3,817	39.9
Increased One Level	2,493	26.0
Increased Two Levels	1,433	15.0
Increased Three or More Levels	1,420	14.8
Total	9,572	100.0
ESOL		
Decreased a Level	223	2.2
Stayed the Same	3,516	34.7
Increased One Level	3,283	32.4
Increased Two Levels	1,621	16.0
Increased Three or More Levels	1,489	14.7
Total	10,132	100.0

Hours of Instruction

We ultimately want to know whether adult basic education makes a difference for those adults who participate in it. The number of hours of instruction participants receive seems a sensible indicator of a program's quality, since we can infer that students are likely to stay longer in programs that meet their needs and spend less time in those that don't. Hours of instruction is also a good measure because the data can be reliably obtained for almost all students.

TABLE 6.5

Hours of Instruction by Service Category and Service Type

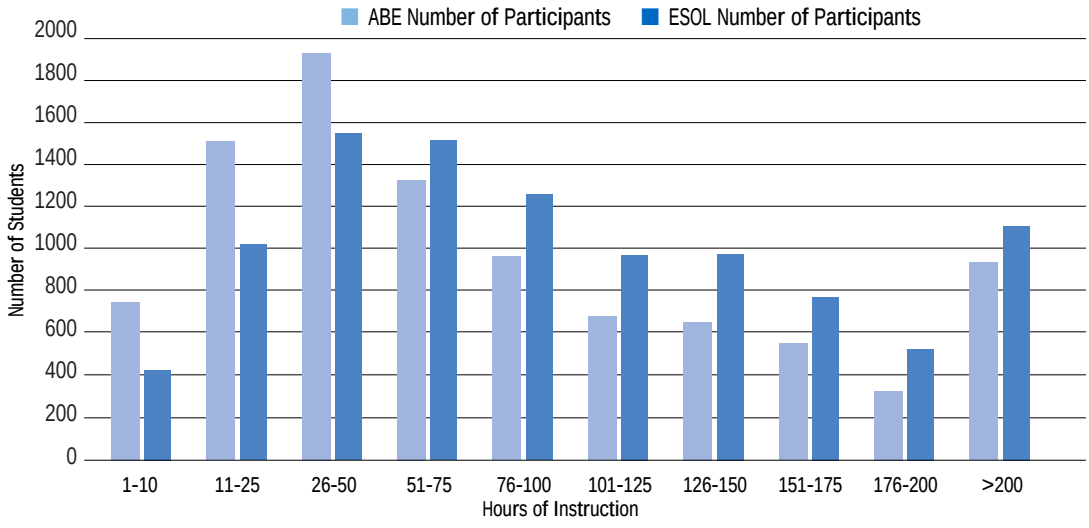
Type of Class	Hours of Instruction[8]	
	MEAN	MEDIAN
Adult Literacy	95	68
Pre-ASE	77	51
ASE/GED	71	50
Beginning ESOL	101	84
Intermediate ESOL	93	74
Advanced ESOL	91	72
TOTAL	97	74

The average number of hours of instruction in our sample is 97 hours (Table 6.5). Compared to earlier years, this number is increasing. In the most recent year, 1999, the average increased to about 107 hours. The median, which is the point at which 50 percent of the participants are below and 50 percent are above, is often a better indicator than the mean which can be greatly influenced by a small number of students. Looking at the median for beginning ESOL students, for instance, we see that half of the students stayed for 84 hours or more of instruction, and half received less than 84 hours of instruction. The median hours for all students is 74 hours.

Overall, students in the Commonwealth receive more hours of instruction than their counterparts across the country (Table 6.6). The median hours of instruction for adult literacy, pre-ASE and ASE students in Massachusetts is well above the median in other regions of the country. ESOL students in the West receive significantly more hours of instruction

FIGURE 6.1

Distribution of Hours for ABE and ESOL Students



8 This is based on 19,800 students, which is an unduplicated count of students and includes all students who received at least an hour of instruction. This average is slightly different from MDOE estimates because our sample includes all students with at least 1 hour of instruction but it does not include data from students tutored by volunteers managed by Literacy Volunteers of Massachusetts. This is in contrast to federal guidelines that only count students who have received 12 hours of instruction. About 8 percent of ABE students and 4 percent of ESOL students attend more than 1 hour but less than 12 hours of instruction.

TABLE 6.6

Median Hours of Instruction by Program Type, Massachusetts Compared to Other Regions of the United States*

Region	Basic Literacy/ Pre-ASE Hours	GED Hours	ESOL Hours	Overall Hours
North Central	25	34	57	34
Northeast	58	33	77	50
South	30	24	62	30
West	36	25	136	107
Total U.S.	35	28	113	58
Massachusetts	61	50	84	74

Source: MDOE 1998 data and 1994 National Evaluation of Adult Education Programs

** This table compares 1998 Massachusetts data with 1994 national data. To our knowledge, no comparable 1998 national data were available.*

than students in any other region of the country. Massachusetts is a leader in providing students with more hours of instruction in adult literacy, but the Commonwealth could do better for ESOL students.

The average number of hours conceals the fact that a large number of students attend classes for a small number of hours, and a small number of students attend classes for many hours. Figure 6.1 describes the distribution of hours for ABE and ESOL students in Massachusetts. ESOL students receive more hours of instruction than ABE students, with 23.6 percent of ESOL participants receiving more than 150 hours of instruction compared to 18.6 percent of ABE participants. At the other end of the spectrum, almost one in five students drop out after about a month—approximately 25 hours of instruction. The number of students that the system reaches is limited to a very small number, especially compared to the number of people potentially in need of instruction. Yet, 3,780 (19 percent) of the students drop out after a month. A seat in a class is a valuable and scarce resource. Programs and the Department of Education should do a better of job of finding out why students leave and figuring out how to keep students in that seat so they can achieve learning gains.

If the number of hours of instruction makes a difference in terms of a student's learning gains, we should be able to see greater learning gains for students who receive more hours of instruction. Tables 6.7 and 6.8 describe the percentage of ABE and ESOL students who achieved an increase in grade or SPL level by the number of hours of instruction received and the average learning gains for different lengths of instruction.

As students receive more hours of instruction, they are more likely to achieve learning gains, and the average learning gains increase. Of all the ABE students who received 1 to 10 hours of instruction, 29.0 percent had a learning gain of one or more levels, and 13.6 percent achieved a gain of two or more levels. The average gain for those students who attended 1 to 10 hours was .42 of a grade level. (The average learning gains after just 10 hours of ABE instruction and also after 10 hours of ESOL instruction may appear high, but these early gains reflect recall of material that has already been learned, and this finding is consistent with other research.) In contrast, 75 percent of ABE students who received 151 to 175 hours of instruction achieved a gain of one grade or more. More hours of

TABLE 6.7

Learning Gains by Hours of Instruction for ABE Students

Hours of Instruction	% of Students who Achieved an Increase of 1 level or more	% of Students who Achieved an Increase of 2 levels or more	Average Learning Gains
1-10	29.0	13.6	.42
11-25	40.5	19.4	.68
26-50	46.4	23.4	.89
51-75	55.9	26.9	1.02
76-100	64.2	31.6	1.20
101-125	66.3	35.6	1.34
126-150	71.9	38.3	1.39
151-175	75.0	43.8	1.53
176-200	74.0	47.3	1.59
> 200	77.3	51.2	1.75
Total	55.9 %	29.8 %	1.08

TABLE 6.8

Learning Gains by Hours of Instruction for ESOL Students

Hours of Instruction	% of Students who Achieved an Increase of 1 level or more	% of Students who Achieved an Increase of 2 levels or more	Average Learning Gains
1-10	34.7	12.7	.47
11-25	42.8	17.7	.69
26-50	51.3	20.9	.83
51-75	60.3	26.2	1.00
76-100	68.1	27.9	1.13
101-125	67.8	32.3	1.18
126-150	70.9	38.8	1.41
151-175	76.9	39.8	1.50
176-200	79.9	46.2	1.74
> 200	80.9	50.7	1.77
Total	63.1%	30.7%	1.16

instruction means more learning.

For ABE and ESOL students, the data are clear and consistent. If all students were to receive at least 150 hours of instruction, about three-quarters of them should achieve a learning gain of at least one level. The policy prescription that follows is straightforward: We must get students into the classroom and then make sure they stay there for more hours.[9]

Probability that High School Dropouts Will Earn a High School Credential

In Chapter 2, we argued that people who do not have a high school credential do not have the education needed for the New Economy. One of the goals of the adult basic education system is to help students earn a high school credential. Does the system work? We present three models to answer this question. We look at:

1) the effect of hours of instruction only
2) the effect of hours controlling for (holding constant) student background characteristics
3) the effect of hours controlling for (holding constant) student background characteristics and site characteristics.[10]

The question is important in terms of the overall purpose of adult basic education. Earning a high school credential is the final step in the ABE system, and a high school credential opens many doors. With a high school credential, the recipient can progress to further education and training. Even without further education, the person's labor market prospects are likely to improve and his or her earnings can be expected to be higher. While we are confident of the accuracy of these data, they are limited in the sense that we only know if a student acquires a credential if he or she gets it during the fiscal year that the student took the ABE class and reports it to his or her teacher. Thus, the findings are likely to underestimate the effects of participation. We chose only to include students in our analysis whose entering abilities were greater than or equal to the sixth grade, since pre-ASE and ASE/GED students are the ones for whom attainment of a high school credential is a goal. For participants with lower entering abilities, attainment of a high school credential may be a long-term goal but is not a realistic short-term goal. The decision to include participants whose entering ability was equal to or greater than the sixth grade (pre-ASE level) also makes our analysis conservative. If we had only included students in the most advanced class (ASE/GED), the probabilities reported would be higher.[11]

Key Findings[12]

The key findings of the analysis are:

• Participants who receive more hours of instruction are more likely to earn a high school credential than participants who receive fewer hours of instruction. This relationship depends on the participants' age, race and ethnicity, entering ability, and whether the participants receive some form of public assistance.

• More hours of instruction seem to offset the effect of specific background characteristics, such as age, entering ability, and receipt of public assistance, that make it less likely that the participant will earn a high school credential. The analysis suggests that these attainment gaps are narrower at higher numbers of instructional hours than at lower numbers of instructional hours.

• In addition to hours of instruction and participant background, site characteristics help explain attainment. Large differences exist between instructional sites. Some sites appear to have a positive influence on whether participants will attain a high school credential. Others have a negative or insignificant effect. At this time, we cannot say exactly what characteristics of a site influence student attainment. We believe the differences might be explained by the number of hours in class per week, teacher quality and stability, or possibly other student, classroom, teacher, or program characteristics.

• Participants in Pre-ASE and ASE programs who attend more intensive classes (i.e., classes that meet for more hours per week) are more likely to earn a high school credential than participants who attend classes that meet for fewer hours per week, controlling for hours of instruction received and participant background characteristics.[13]

What is the Relationship between Earning a High School Credential and Hours of Instruction?

We first examine the effect of hours of instruction, not controlling for individual background and site characteristics. Participants who receive more hours of instruction are more likely than participants with fewer hours of instruction to earn a high school credential. For instance, in the sample that includes pre-ASE and ASE students, the probability is 0.14 after 25 hours of

9 It is important to keep in mind that these are descriptive data. They are not based on an analytic model that tries to predict achievement but instead assume the key difference between participants is the number of hours of instruction they received. Student and program characteristics that may affect gains are not considered here. We initially intended to fit a series of models to predict achievement by looking at the effect of hours of instruction while controlling for student background and site characteristics. Based on our exploratory analysis and discussions with MDOE staff about the quality of data, we did not complete this portion of the analysis. We recommend that future research use the improved data from 1999 and beyond to implement this research.

10 Our sample consisted of 6,622 adults who participated in Pre-ASE and ASE programs less 61 cases that were rejected because of missing data. Fifty-six percent of participants in this sample were women. The average age was 28.8 years. Average years of schooling equaled 8.2 years. Slightly over 20 percent were immigrants. 55 percent were white, 21 percent black, 20 percent Hispanic, and the remaining 4 percent were American Indian or Asian. 21 percent received some form of public assistance. 40 percent worked. 29 percent were unemployed and looking for a job, and 25 percent were unemployed and not looking for work. The remainder was either retired persons or homemakers. Most participants spoke English as their first language (72 percent). 16 percent spoke Spanish as their first language.

11 We conducted an analysis that supports this statement.

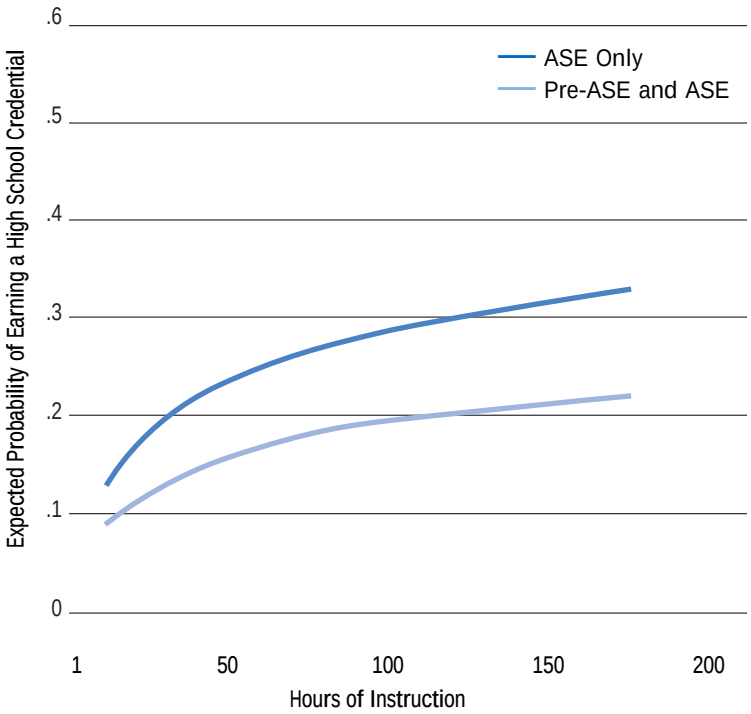
12 These findings do not establish evidence of a causal relationship between hours of instruction and attainment of a high school credential, nor do they support the notion that achievement of high school dropouts in Pre-ASE and ASE programs is fully understood.

13 This is consistent with a pilot program in the U.K. The Basic Skills Agency, which manages adult education in the U.K., has been piloting nine intensive basic skills programs. Though an independent evaluation is not yet complete, feedback so far is very positive.

14 See Table C.1 in Appendix C for the parameter estimates, approximate p-values, and goodness-of-fit statistics for this model.

FIGURE 6.2

Fitted Probabilities that Participants in Pre-ASE and ASE and Participants in ASE Programs Only Will Earn a High School Credential, as a Function of Hours of Instruction



instruction compared to 0.19 at 100 hours of instruction and 0.22 after 225 hours of instruction (Figure 6.2).[14] While the differences in the probabilities are statistically significant, the differences in probabilities are small. If we include only ASE students, the likelihood of earning a high school credential increases and the differences are greater at more hours of instruction.

What is the Relationship between Earning a High School Credential and Hours of Instruction, Controlling for Student Background Characteristics?

We next look at the effect of hours of instruction while controlling for (holding constant) several background characteristics.[15] Here we look at the effects of different influences on a student's probability of earning a high school credential. We look at whether a specific background characteristic impacts the probability of earning a high school credential.[16]

The key finding to be gleaned from this model is that, in addition to hours of instruction, participant background predicts attainment. However, our ability to draw inferences about the size of the effect of specific background characteristics is limited by the available data, specifically imperfect measures of socioeconomic status and other background characteristics. Nonetheless, we conclude that whether participants will earn a high school credential depends on who they are in addition to the effort they put forth. We show how the students' background characteristics influence the expected probabilities in the following three examples. We consider: 1) the effects of a person's race or ethnicity and employment status; 2) the effects of a person's age; and 3) the effects of a person's entering ability. In each case, we hold constant all other variables.

Race and Employment Status

We first look at the direct effect of race and employment status on the likelihood of a student earning a high school credential, holding constant other background characteristics.[17] The key findings include:

• The results suggest that race and ethnicity are related to attainment, but future research is needed to understand fully the effect of race. Our analysis is limited by not having direct measures of a person's socioeconomic status (e.g. income). Future work could determine the extent of the influence of race by including direct measures of socioeconomic status instead of the indirect measures of employment and public assistance status. This will show which portion of the variation in attainment can be attributed to race or to other background characteristics.

• Based on our current analysis, it is nevertheless true that white students are more likely to earn a high school credential than Hispanic or black students, irrespective of whether students are employed or unemployed and looking for work.

• The probability of receiving a high school credential for participants in all racial groups is greater for those who work than it is for those who are unemployed and looking for work—again controlling for all other background characteristics. For instance, after 100 hours of instruction, the predicted probability for black employed participants is 0.18 and it is 0.13 for unemployed black participants.

An attainment gap between whites and blacks and Hispanics is consistent with the race-based achievement gap, as measured by differences in test scores, that has been documented in K-12 education. Before we can conclude that the ABE system produces different outcomes for different racial and ethnic groups, further research is needed to disentangle the effects of race, income, and other possible factors currently not included in the analysis. It may be, for instance, that some of the race effect reflects differ-

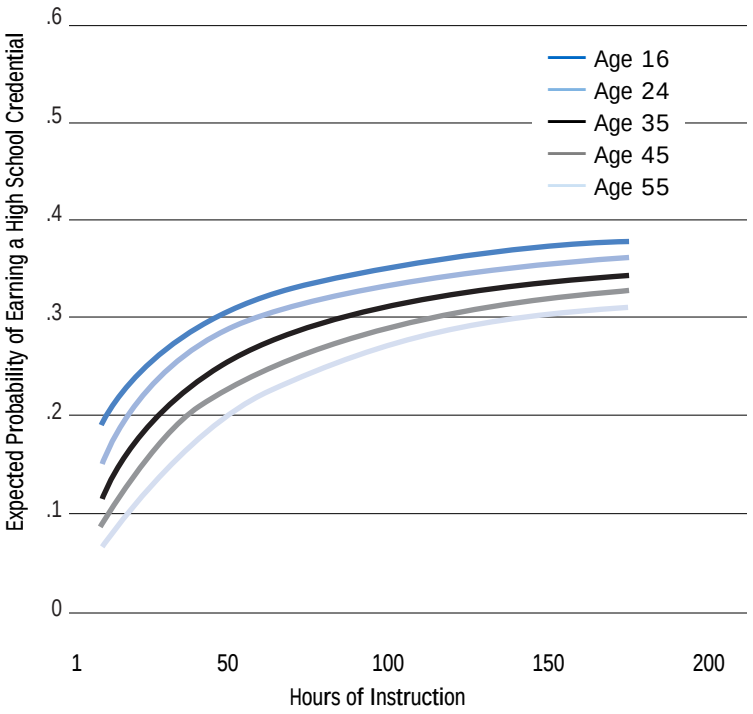
15 Full regression results are presented in Table C.1 in Appendix C which includes the parameter estimates, approximate p-values, and goodness-of-fit statistics for this background model describing the probability that high school dropouts will earn a high school credential as a function of hours of instruction, controlling for age, race/ethnicity, socioeconomic status, entering ability, first language, and interactions between hours of instruction and student background characteristics.

16 We fitted a series of models including age, race, gender, prior education, entering ability, first language, employment status, and public assistance status. We tested for two-way interactions between hours of instruction and these background characteristics. We retained only those main effect and interaction terms that were significant. As a result, gender and prior education were removed from the model. In addition to the significant effects we highlight (i.e., race/ethnicity, employment, age, and entering ability), we also found that homemakers are more likely than employed, unemployed, and retired participants to earn a high school credential. Furthermore, participants who spoke Portuguese were less likely and participants who spoke Cambodian were more likely to earn this credential. The effect of public assistance status depended on hours of instruction received. Individuals interested in a full taxonomy of nested models can request regression output from the authors.

17 To demonstrate the effect of race and ethnicity, we controlled for other background characteristics, including age, first language, entering ability, and whether participants received public assistance.

FIGURE 6.3

Fitted Probabilities that White Employed Pre-ASE and ASE Participants of Different Ages Will Earn a High School Credential as a Function of Hours of Instruction, Controlling for Other Background Characteristics



ences in incomes for which we did not have a direct measure. Or, it may be that the influence of race is related to other student, teacher, or program characteristics not included in the model.

There are competing theories about the cause of the gap. It appears to be a result of a complicated mix of expectations for students, parenting practices, and perhaps, cultural differences.[18] It might also reflect differences in the quality of schooling received. From the perspective of the adult basic education system, we care about the effect of hours of instruction on the likelihood of obtaining a high school credential. We care if participation in adult basic education affects the existing gap, and in fact, the goal should be to narrow the gap through hours of instruction. We find that hours of instruction make a positive difference for all students by increasing the probability that all students will earn a high school credential.

Age

We next looked at the effect of a person's age, while controlling for all other background characteristics. We found that the influence of age depends on hours of instruction and vice versa. Older people are less likely to attain a high school credential, but as they attend classes for more hours, the difference between older and younger students almost disappears (Figure 6.3). It makes sense that it is harder for older students to earn a high school credential. They have been out of school longer, and more time has elapsed since they originally learned the material in school. They face the task of relearning the material, whereas younger students are more likely to be able to recall the material from their days in school. Since the differences shrink as students receive more hours of instruction, the adult basic education system can make a positive difference for older students if they stay in class long enough.

As this figure suggests, it is noteworthy that:

- At all ages, the predicted probability of earning a high school credential is greater at higher levels of participation.
- At all hours of instruction, the probability of earning a high school credential is lower as age increases.
- At higher levels of participation, the discrepancies between different age groups have decreased and almost disappear, suggesting that duration of instruction mediates the effect of age.

Entering Ability

Finally, we looked at the effect of entering ability, while controlling for all other background characteristics.[19] Hours of instruction and a student's entering ability matter (Table 6.9, Figure 6.4). The expected probability of receiving a high school credential is lower at low levels of entering ability and higher at high levels of ability, suggesting that the skills and experiences that participants bring to their classes matter. Our model predicts that a student who enters at the eleventh grade level and receives only 25 hours of instruction is more than twice as likely to get a high school credential than a student who enters at the seventh grade level and receives 225 hours of instruction. It is noteworthy that at any level of entering ability, the expected probability of receiving a high school credential is higher when participants receive more instructional hours.

18 For a detailed discussion of the gap, see Christopher Jencks and Meredith Phillips, eds., *The Black-White Test Score Gap* (Washington, D.C.: Brookings Institution Press, 1998).

19 We tested whether the model would differ if we included prior years of schooling instead of entering ability. An important difference is that the effect of years of schooling does not vary depending on hours of instruction, unlike the differing effect in the models with entering ability (i.e., there is no two-way interaction). Individuals interested in this model can request regression output from the authors.

FIGURE 6.4

Fitted Probabilities that White Employed Pre-ASE and ASE Participants of Different Levels of Entering Ability Will Earn a High School Credential as a Function of Hours of Instruction, Controlling for Other Background Characteristics

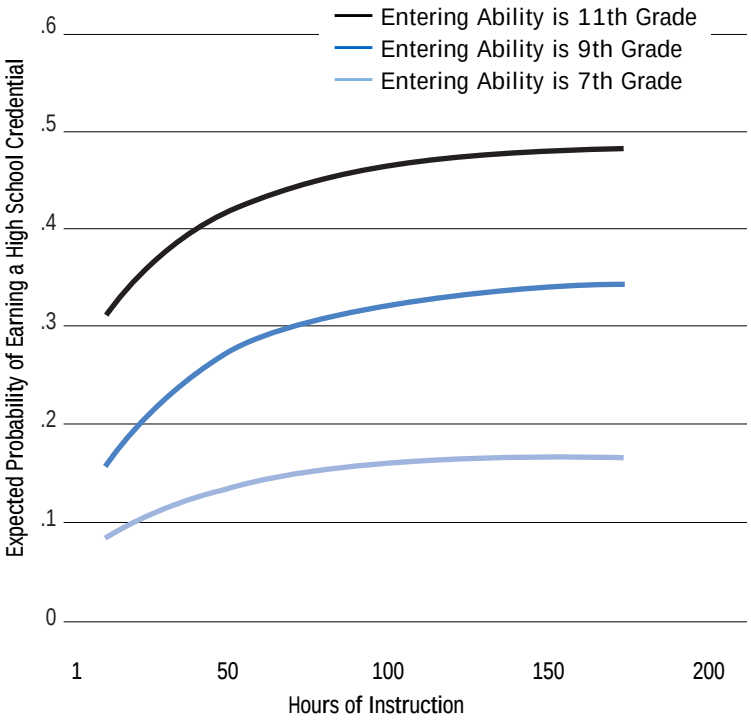


TABLE 6.9

Expected Probabilities that White Employed High School Dropouts Will Receive a High School Credential as a Function of Hours of Instruction and Selected Levels of Entering Ability[20]

Hours	GLE 7	GLE 9	GLE 11
25	0.13	0.23	0.40
50	0.14	0.27	0.43
75	0.15	0.30	0.45
100	0.16	0.32	0.46
125	0.16	0.34	0.47
150	0.17	0.35	0.48
175	0.17	0.36	0.49
200	0.18	0.37	0.50
225	0.18	0.38	0.50

What is the Relationship between Receipt of a High School Credential and Site Characteristics, Controlling for Hours of Instruction and Student Background Characteristics?

Finally, we consider whether the site of the program influences the likelihood of attaining a high school credential. We find that the site has a lot to do with student attainment.[21] We don't know for certain what the key factors are. Previous studies suggest that staff consistency and the number of full-time teachers are likely explanations. In a first attempt to understand the effect of site characteristics, we looked at intensity of instruction, as measured by the number of planned class hours per week. Intensity of instruction is important to consider because the findings can easily influence the program design in order to enable students to have the greatest learning gains in the most time- and cost-effective manner. Intensity of instruction, as measured by class hours per week, increases the probability that high school dropouts in Pre-ASE and ASE programs will receive a high school credential before the end of the (fiscal) year. Based on our findings, participants in Pre-ASE and ASE programs who attend more intensive classes (i.e. classes that meet for more hours per week) are more likely to earn a high school credential than participants who attend classes that meet for fewer hours per week, controlling for hours of instruction received and participant background characteristics (Table 6.10).

TABLE 6.10

Expected Probabilities that White Employed Pre-ASE and ASE Participants Will Earn a High School Credential as a Function of Intensity of Instruction, Controlling for Student Background Characteristics and Hours of Instruction[22]

Class Hours Per Week	Expected Probability of Earning a HS Credential After 48 Hours of Instruction
4	0.24
5	0.24
6	0.25
7	0.26
8	0.27
9	0.27
10	0.28
11	0.29
12	0.30
13	0.31
14	0.32

A short, intensive GED or pre-GED class seems more effective than a class that meets for a few hours a week over a long period of time. Our model predicts that students who receive 100 hours of instruction in classes that meet for 12 hours per week are as likely to earn a high school credential as students who receive

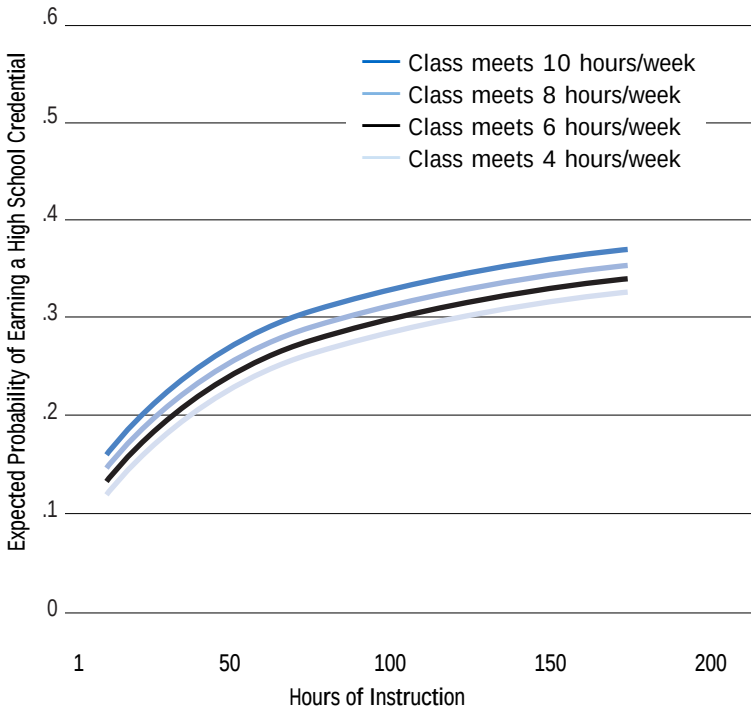
20 We control for age, public assistance status, first language, and two-way interactions between hours of instruction and student characteristics.

21 The relationship between several sites and attainment is positive and significant but effect sizes range considerably. In addition, many site coefficients were either positive or negative but insignificant.

22 We set hours of instruction to the average of ln hours or roughly equal to 48 hours of instruction. We used the average of age, entering ability, and first language. Since most participants were white and not on public assistance, we set public assistance and black, Hispanic, Asian, and American Indian to zero.

FIGURE 6.5

Fitted Probabilities that White Employed Pre-ASE and ASE Participants Will Earn a High School Credential as a Function of Hours of Instruction and Intensity (ie., planned class hours per week), Controlling for Other Background Characteristics



225 hours of instruction in classes that meet for 6 hours per week. It will take the second group of students more than twice as many hours of instruction to have the same likelihood of earning a high school credential (Table 6.11).[23] Figure 6.5 illustrates the effect of intensity of instruction. It shows how the probability of earning a high school credential is higher in more intensive classes than it is in less intensive classes. The figure also shows that within each class participants who receive more hours of instruction are more likely to earn a high school credential than participants who receive fewer hours of instruction.

Summary of the Probability of Earning a High School Credential

One of the final steps of the adult basic education system is to help students earn a high school credential. This step will help people who currently have limited options in the New Economy. Does participation in ABE programs affect the likelihood of earning a high school credential? Our analysis suggests that three factors matter: 1) hours of instruction; 2) students' background characteristics, some of which increase the likelihood of earning a high school credential and others of which decrease the likelihood; and 3) site of instruction.

Hours of instruction make a difference. A person's chances of earning a high school credential always improve with more hours of instruction. Our conclusion: We must focus our energies on getting students to come to class and to stay in class longer.

Given that sites differ in many ways, it is not surprising that some sites appear more effective than others in helping students succeed. It does not make sense that we haven't systematically tried to understand what does and does not work. This research is the first step in that process. Our findings are clear that intensive pre-GED and GED instruction is more effective than instruction over a longer period of time at fewer hours per week. The Department of Education should

TABLE 6.11

Expected Probabilities that White Employed Pre-ASE and ASE Participants Will Earn a High School Credential as a Function of Hours and Intensity of Instruction, Controlling for Additional Background Characteristics[24]

Hours of Instruction	Class Hours Per Week					
	4	6	8	10	12	14
25	0.20	0.21	0.23	0.24	0.26	0.28
50	0.24	0.25	0.27	0.29	0.30	0.33
75	0.26	0.28	0.30	0.31	0.33	0.36
100	0.28	0.30	0.31	0.33	0.35	0.38
125	0.29	0.31	0.33	0.35	0.37	0.39
150	0.31	0.32	0.34	0.36	0.38	0.41
175	0.32	0.34	0.35	0.37	0.39	0.42
200	0.33	0.34	0.36	0.38	0.40	0.43
225	0.33	0.35	0.37	0.39	0.41	0.44

23 We tested how accurate our model is by comparing what the model predicts to what actually happened. We find that our model fits the data well, and the differences between our predictions regarding who will earn a high school credential and who actually did earn a credential are small and statistically insignificant. Individuals interested in obtaining a full description of the fit of the model can request it from the authors.

24 We used the average of age, entering ability, and first language. Since most participants were white and not on public assistance, we set public assistance and black, Hispanic, Asian, and American Indian to zero. It is also important to note how these predictions correspond to the data. For instance, among white employed participants, only 10 percent attended classes for more than 177 hours. Furthermore, only about 10 percent of white employed participants attended classes that meet for 10 or more hours per week.

offer intensive pre-GED and GED courses, and it should also evaluate the effect of intensive instruction in other classes as well. This research looks only at the probability of earning a high school credential. It does not consider what test scores students are likely to get. Recent research suggests that a person's GED score influences future earnings, and those with higher GED scores are likely to earn more.[25] If the ABE system adds intensive pre-GED and GED courses, as we believe it should, it must also start monitoring the GED scores of its participants to determine if there is a difference in scores depending on the form of instruction students receive.

Labor Market Outcomes

The education that occurs in the classroom is only one step in helping people upgrade their skills and improve their lives. To assess the value of the state's investment in adult basic education programs, we must learn about what happens to students after they leave the classrooms so that we can answer questions such as: What happens one year later? What happens five years later? What happens ten years later? What happens to them in the labor market? Does participation in ABE increase their wages or improve the quality of jobs they hold?

Currently, little information is collected by providers and state agencies about what happens to students after they leave the programs. We were able to look at whether a participant found a job during the year that he or she participated in a program. About one-quarter of the participants were unemployed and looking for work when they entered the adult basic education system. Of the people looking for work, 18.2 percent or 893 people found a job during the fiscal year (Table 6.12). There were differences between the outcomes of ABE and ESOL students, with ESOL students almost twice as successful in their job search.

In order to determine whether the hours of instruction had an effect on a student's ability to find a job, we analyzed two subsamples of unemployed students—ABE and ESOL students—who were looking for work in 1998. We asked whether participation, as measured by hours of instruction, affected the probability that unemployed participants who were looking for work would find a job.[26]

Key Findings

Unemployed ABE Students

• Unemployed ABE students who receive more hours of instruction are more likely to find a job than participants with lower levels of participation.

• Of all the background characteristics in our analysis, only public assistance status impacted whether a student would find a job before the end of the fiscal year. Participants who receive public assistance are less likely to find a job than participants who do not receive any form of public assistance.

• Participants with greater learning gains are more likely to find a job than participants with smaller learning gains.

Unemployed ESOL Students

• For unemployed ESOL students, hours of instruction did not explain whether students found a job. Factors other than hours of instruction may explain who will find a job. One possible explanation is the availability of job placement services. Another is the extent to which the participant is connected to community resources that may assist her in finding a job. More research is needed to confirm or disprove these hypotheses.

A major shortcoming of the information available from the adult basic education system is that it is not connected to information collected by agencies that track labor market outcomes. Right now, we can

TABLE 6.12
Labor Market Goals and Outcomes of Participants

	All Participants		ABE Participants		ESOL Participants	
	Number	Percentage	Number	Percentage	Number	Percentage
Employed	9,145	46.2	3,756	39.1	5,389	52.8
Unemployed and Looking for Work	4,900	24.7	2,619	27.3	2,281	22.3
Found Job in Fiscal Year 1998*	893	18.2	332	12.7	561	24.6

** Percentage of the Unemployed and Looking for Work*

25 See John Tyler, Richard Murnane, and John Willett, "Do the Cognitive Skills of School Dropouts Matter in the Labor Market?" NCSALL Report, April, 2000.

26 Regression coefficients and goodness-of-fit statistics for the chosen model for the subsample of unemployed ABE participants are included in Appendix C. Output from the analysis of the subsample of unemployed ESOL participants can be obtained from the authors.

say that 893 participants found jobs, but we don't know anything about those jobs, such as whether they are dead-end or on career paths to more opportunities. We don't know anything about the wages the participants are earning.[27] We don't know what will happen in one year's time. We cannot answer these critical questions, in part, because the state currently does not require different workforce agencies to share information. This lack of knowledge is more the result of a lack of political will than any technical barriers. It would require collecting the social security numbers of participants and then requiring the Department of Revenue and other agencies that track labor market participation to share their data. This raises real privacy issues, and there must be provisions for people who do not want to provide this information or who do not have social security numbers. We believe that these issues can be addressed with proper safeguards, and the value of tracking participants justifies the need to collect this information. The Governor's office should exercise the leadership necessary to make this happen, and the mandate of the Department of Revenue must be changed.

27 In Hal Beder's review of evaluations of adult literacy programs, he found that participation is likely to result in increased earnings. See Hal Beder, "The Outcomes and Impacts of Adult Literacy Education in the United States."

28 This table only includes participants who received at least twelve hours of instruction, and so the numbers will be slightly different from other numbers presented in this chapter.

Range of Other Outcomes over Time

Thus far, we have focused on four indicators of program effectiveness: learning gains, hours of instruction, probability of attaining a high school credential, and the probability of finding a job. There are other types of outcomes that participants might achieve. In this section, we look at a broader range of outcomes and compare the results over the last three years. Table 6.13 summarizes these outcomes.[28]

The number of students who attained a GED has increased over the last three years to almost seven percent. The number and proportion of participants who entered an education or training program has also increased, although the numbers are still quite small. In 1999, only 557 students entered an education or training program after completing an ABE class.

As for societal outcomes, the proportion of participants who received United States citizenship appears to have decreased slightly, although the actual number has increased. The same is true for the number and proportion of participants who registered to vote or who voted for the first time. The absolute number is higher, but the proportion is slightly lower.

In the economic indicators there have been increases in the number and proportion of participants

TABLE 6.13

Educational, Societal, Economic, Parenting, and Other Outcomes for 1997-1999

Outcomes	Number of Participants and Proportion of Total Participant Population by Outcome Category					
	Fiscal Year 1997		Fiscal Year 1998		Fiscal Year 1999	
EDUCATIONAL	n=16,008		n=20,294		n=23,381	
Obtained Adult HS Diploma or Passed the GED	890	5.56%	1,189	5.86%	1,626	6.95%
Entered Education or Training Program	152	0.95%	233	1.15%	557	2.38%
SOCIETAL						
Received U.S. Citizenship	193	1.21%	204	1.01%	221	0.95%
Registered to Vote or Voted for the First Time	82	0.51%	103	0.51%	112	0.48%
ECONOMIC						
Gained Employment	560	3.50%	901	4.44%	1,470	6.29%
Obtained Job Advancement or Secured Employment Retention	580	3.62%	927	4.57%	2,334	9.98%
Removed from Public Assistance	24	0.15%	56	0.28%	69	0.30%
PARENTING						
Read More to Children	838	5.23%	1,051	5.18%	112	0.48%
Greater Involvement in Children's Schooling	1,478	9.23%	1,715	8.45%	147	0.63%
OTHER	1,640	10.24%	1,330	6.55%	15,740	67.32%

Source: Massachusetts Department of Education, Federal Statistical Reports.

reporting favorable outcomes. The percentage of participants who advanced in or secured their jobs is almost 10 percent, and 1,470 participants gained employment.

There has been a sharp decrease in the parenting outcomes measures, both in absolute numbers and in proportion of participants. We think these outcomes might be captured in the "other" category, which has increased tenfold. "Other" outcomes include passing some of the five GED tests, increasing parent-child interactions, engaging in preventive health care activities, and other outcomes. In 1999, 67 percent of participants reported having achieved other outcomes.

In 1999, only 557 students entered an education or training program after completing an ABE class.

While these data are informative, particularly when attempting to look at trends over time, there are some serious limitations in interpreting these numbers. As mentioned before, the numbers may seem small, but the data are only for a single year. A student who does not achieve a goal in one year might achieve that goal in the years following participation in a class. A student in a GED class might not take and pass the GED until two years later. That outcome would not be reflected in these numbers. As a consequence, these statistics underreport outcomes.

Moreover, outcomes of students are often unknown. Participation in adult literacy classes is much more fluid than in K-12 classes. Many adults stop attending classes without offering a reason. It could be that a student finds a job that conflicts with the schedule of the class and simply stops attending classes. Though that would be a positive outcome, this outcome would not necessarily be known and therefore would not be recorded by the program.

Finally, the data are somewhat misleading because they do not compare the intentions of the students to the given outcomes. For example, in 1998, 1,189 students or 5.86 percent of the total adult students reported obtaining a GED. The outcome data are reported for all students, but not all students are studying to take GED tests. For most students in ESOL classes, it would not be appropriate to measure whether they have obtained their GED, and students in ESOL classes account for more than half of the students in adult basic education programs. During 1998, only 3,447 students were enrolled in GED preparation programs. A more accurate outcome measure would be that 34 percent of those who came to study for the GED reported passing the test. This more—accurate measure increases the outcome measure sixfold. Even this number is too low. The number would increase if we include the students who passed the test but did not report back to the program and the students who pass the test after completing their courses. Then the outcome measures would likely tell quite a different story, one that is much more positive. This particular problem could be solved fairly easily if the Department of Education matched data between its GED and SMARTT databases.

It only makes sense to compare student outcomes with goals that are appropriate at their level. By measuring outcomes more accurately, we will have a clearer sense of which types of programs are not reaching their objectives. We will also have a better picture of how well students are being served in relation to their goals.

Concluding Thoughts

In this chapter, we have assessed the effectiveness of the adult basic education system in five different ways. We have analyzed the 1998 data, looking at 1) learning gains of the participants; 2) number of hours of instruction received; 3) probability that students will earn a high school credential; and 4) probability of finding a job. Finally, we have looked at a broad range of outcomes from 1997-1999. We find adult basic education to be effective, but there is room for improvement. This analysis provides a baseline from which future improvements can be measured.

Students learn in ABE classes. More than half of the students achieved learning gains, and almost one-third gained more than two levels. While this is quite positive we do have some concerns about the quality of data, which we discuss below. In terms of hours, students spend on average slightly less than 100 hours in class over a twelve-month period, and that number appears to be increasing. Massachusetts is doing well in this respect. As students receive more hours of instruction, more of them achieve learning gains. Our conclusion: If we get students to come to class and get them to stay longer, they learn more. We need to focus on doing both.

Whether a student is likely to earn a high school credential is influenced by the number of hours of instruction, the student's background characteristics, and the program through which that student attends

classes. While we know the site is important, we don't know exactly what matters about a given site, and we recommend this as a topic of future study. Qualitative studies might be instructive in trying to disentangle this effect. We looked at intensity of instruction, which is the number of hours a class meets per week. For students preparing to earn a high school credential, intensity makes a difference and intensive instruction appears more effective than instruction over a longer period of time with fewer hours of classroom instruction per week.

There are several limitations to our analysis. First, we do not have a counterfactual case. That is, we don't know what would have happened to these participants if they had not participated in the programs. Perhaps some of them would have studied for and passed the GED on their own.

Test scores may not capture all outcomes, but they do provide a common language and a basis of comparison to evaluate students' progress.

The quality of data is a second limitation. The Adult and Community Learning Services cluster within the Mass. Department of Education, led by Robert Bickerton, has made great efforts to improve the collection and quality of data. Prior to 1997, the Department used a paper-based, aggregate reporting system that only collected program-level data. It did not collect data for the individual students. As a result, the Department had no sense of whether students were double-counted within and between programs and whether outcomes were overstated, understated, or accurate.

With the implementation of the SMARTT system, the quality of the data has improved. When duplication and other errors were removed, the number of students who appeared to achieve favorable outcomes decreased and on the surface it appeared that the programs were not doing as well. These changes, however, are clearly related to the state's improved data-collection efforts. Robert Bickerton and the members of his staff deserve praise for their commitment to providing a more accurate picture of our ABE and ESOL efforts.

That is the good news. Much work remains, however, to improve the quality of data so that we can be more confident of their accuracy. Currently, programs report a student's entry and exit level, according to federal and state Department of Education definitions. These levels are supposed to be based on standardized tests or any of the more than fifty other assessments that the Mass. Department of Education acknowledges. Programs are expected to indicate which method they used and provide the dates of assessment. When we reviewed the 1998 data, we found that the assessment dates and methods related to entry and exit levels were lacking for many students.[29] Because of this, we could not tell when and how most students were assessed and how programs assigned grade levels or student-performance levels.

The design of the database compounds these difficulties. The Fiscal Year 1998 system is designed so that an exit level is required in the database. In cases where standardized tests were not administered, programs use alternative assessments such as student portfolios or teacher observations to estimate a student's learning gains. Because of the lack of information entered, there is no way to know exactly how many of the assessments were based on standardized tests as opposed to estimates, and there is no way to account for differences between these assessment methods. Moreover, when the data are entered, programs have access to the initial assessment score, and therefore, exit levels may be biased.

All of this reinforces the need to assess students using standardized tests or other forms of standardized assessment and report scores not grade levels. Test scores may not capture all outcomes, but they do provide a common language and a basis of comparison to evaluate students' progress. If tests are carefully chosen, test scores are less subject to bias, and may more accurately capture smaller learning gains.

In our conversations with people at the Department of Education, it appears that they are aware of these issues and are currently working to improve the data and build in mechanisms to assure data quality. If we want to measure the return on our investment in the adult basic education system in order to improve programs that do not measure up, then we need more accurate data to evaluate the efficacy of the programs. It is critical that the Mass. Department of Education address the quality of existing data. We also suggest that 1) they establish a longitudinal data set that tracks a subset of students over a longer period of time, and 2) they explore the possibility of an evaluation research project using a randomized experiment. The

29 According to staff members at the Department of Education, if the date of assessment was missing or invalid, the date was set to the start of the fiscal year or the intake date (whichever was the latest). For the purpose of satisfying SMARTT rules, this sufficed.

Department of Education's data should also be pooled with that of other state agencies so it is possible to track participants over time on a variety of measures. Texas, Florida, and other states are leading the way in matching data of different state agencies to get a more complete picture of what happens to their students after they leave the classroom. There is no reason that the Department of Education's ABE database should not already be connected to its own GED database. It should also be connected to the databases of other state agencies. To find out what happens to ABE participants in the labor market over time will require the collecting of social security numbers, which is the identifier used by the Department of Revenue. The more we know about what happens to participants, the better we can serve them and the better their outcomes should be, which after all is the goal of the adult basic education system—giving people tools to build their skills and thus improve their lives.