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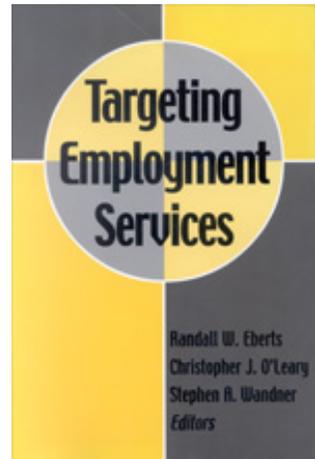
Measures of Program Performance and the Training Choices of Displaced Workers

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Chapter 7 (pp. 187-220) in:

Targeting Employment Services

Randall W. Eberts, Christopher J. O'Leary, and Stephen A. Wandner, eds.

Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2002

DOI: 10.17848/9781417524440.ch7

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Measures of Program Performance and the Training Choices of Displaced Workers

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Passage of the Workforce Investment Act (WIA) has focused policymakers' attention on measuring the performance of employment and training programs. Explicit performance measures can provide timely information to policymakers and program operators for assessing and improving their policies and programs.

Under WIA's predecessor, the Job Training Partnership Act (JTPA), policymakers relied on two approaches for obtaining this information. First, they used formal program evaluations, including the National JTPA Study. These evaluations estimated the "value added" or the return on investment (ROI) of these programs and their net benefit to participants, taxpayers, and governments.

Second, policymakers implemented a system of performance standards. Under this system, they assess the performance of their programs by whether measures of participants' output, such as their entered employment rate, employment retention rates, or postprogram wage levels, exceed pre-designated targets or standards (Barnow 1992). Policymakers intend that these performance standards would substitute for more costly and less timely formal ROI evaluations. Al-

though the relative merits of these approaches for measuring program performance has been hotly contested, one purpose that both share is that they provide policymakers and program operators with an objective basis for assessing and improving their programs.

It is our contention in this chapter that timely and accurate value-added performance measures not only help policymakers improve the effectiveness of their programs, but these measures also can help improve programs by providing likely participants with better information. This information should affect their participation decisions and lead to more efficient use of both their own and government's training resources. To understand this point, consider that participation in many employment and training programs often involves (at least) a two-stage decision process in which individuals decide whether to apply for programs, and program operators decide whether to admit them to the program. Individuals' decisions to apply for or enroll in a program depend on the net benefits that they expect to receive from them. Therefore, program performance measures should improve individual decision-making and improve program performance by ensuring that those who apply to the program in the first place are those most likely to benefit from it.

In this chapter, we show how information about the training decisions made by unemployed adults and the impact of the programs in which they enrolled can improve program performance by potentially improving individual decision making. We base our analysis on the experiences of dislocated workers in Washington State, some of whom enrolled in community college courses around the time of their job losses.

In the remainder of the chapter, we describe the factors that individuals should take into account when deciding whether to participate in training. Here we observe that the cost of retraining displaced workers is likely larger than the cost for other training participants, such as youths and economically disadvantaged persons. Therefore, this population likely requires that training generate larger impacts in order for it to be worthwhile. We next examine how individuals' characteristics relate to their propensity to enroll and complete such courses. We assume that improving labor market prospects is the dominant factor influencing dislocated workers' decisions to enroll in community college courses. Accordingly, information about the characteristics of individuals

who enroll in these courses provides information about the types of individuals who are most likely to benefit from retraining. We then present estimates of the impact of alternative community college curricula on earnings based on a formal evaluation of the returns to classroom training. We believe that this information is helpful not only to policymakers who subsidized community college schooling, but also to displaced workers. Finally, we discuss how to use this information to improve program performance by improving individuals' decision-making.

DECIDING WHETHER TO PARTICIPATE IN TRAINING

We base our analysis of the training or schooling decisions of displaced workers on the simplifying assumption that dislocated workers view attending school as a way to improve their labor market prospects. Accordingly, we can judge the success of public investments in these workers' training or schooling on whether this goal is met. This section discusses two frameworks presented in the academic literature for characterizing the decision to invest in training following the loss of a job (Heckman, LaLonde, and Smith 1999).

A broader view of school attendance would include the possibility that dislocated workers attend school for their own immediate enjoyment or to create job opportunities that are more enjoyable, even if not higher paying. Because most displaced workers can attend school and not search for work without jeopardizing their unemployment insurance (UI) benefits, it is possible that substantial numbers decide to take a break from work to pursue personal interests. This motivation for attending school can be productive from a social point of view, because it lowers the cost of job loss, and thereby the cost born by firms and society from making production more efficient. The importance of investment versus consumption motives might be assessed by surveying dislocated workers about their motivation for seeking retraining. We know of no such survey data with which we could examine this contention. Accordingly, in this chapter we focus solely on the implications of economic motives for seeking training.

Training Augments Human Capital

In the more familiar “human capital” framework, individuals view training as an investment. Accordingly, individuals decide to participate in training when the benefits they expect to receive exceed the costs of training. Further, when choosing among alternative courses of study, individuals will choose the one with the greatest net benefit.

In most settings, analysts measure the benefit of training as the difference between participants’ postprogram earnings and the earnings they would have received had they not participated in training. This earnings impact could result from either increased wage rates or increased hours worked. Therefore, in order for displaced workers to make productive decisions about whether to participate in training and what to study, they should know what the likely impact of training is and whether this impact varies among programs or alternative courses of study.

The impact of classroom training reported in studies of economically disadvantaged persons or the returns to community college schooling reported for young adults may provide a misleading basis for displaced workers’ training decisions. First, displaced workers are older than the other training participants, and the impact of retraining may differ by age. Second, they are also better educated and already possess more vocational skills on which to build. Finally, if the impact of retraining varies among individuals in a population, then the average impact for a group whose cost of participation is low is likely to be lower than for a population whose cost of participation is high. In the latter case, the only persons who participate in training are those who expect the benefits of retraining to outweigh the more substantial costs. If displaced workers based their training decisions on the average annual impact measured for young community college students or economically disadvantaged trainees, they may understate the likely benefits of training. Individuals who have had difficulty finding and keeping any job may participate in a training program that they expect to yield relatively small impacts, whereas a corresponding displaced worker would not. As a consequence, the impact of training as measured by the average of the individual benefits for all young participants is likely to be lower than for a sample of displaced workers. A related point is that evidence showing that displaced workers receive larger benefits from training

than younger individuals does not imply that training is more effective for displaced workers.

Another determinant of displaced workers' decisions to participate in retraining is the cost of these programs. There are three components of the cost of training. First, there are the direct costs, which include tuition, fees, supplies, transportation, and care for children and elderly relatives. Next, there are the personal costs, which include the emotional impact of returning to a classroom setting and the toll that time spent in training might take on a person's family. These costs might be negative for some participants if they consider schooling a form of consumption or entertainment. In any case, these emotional costs are difficult to quantify. As a result, although they are acknowledged, analysts usually do not explicitly take them into account. Finally, the largest cost of retraining can be the lost earnings that displaced workers experience if they delay their return to work in order to invest in new skills. If displaced workers decide to return to school to acquire new skills, they are likely to search for new jobs less intensely. As a result, while they are in school they lose earnings that they would have received had they found a new job. These lost, or forgone, earnings constitute a cost of training. Further, displaced workers who return to school also may forgo, at least for the time being, both the formal and informal on-the-job training that they would have received at a new job. Under these circumstances, the labor market experience that they lose while in school also is a cost of training.

Compared with other individuals whom policymakers encourage to receive training, the foregone earnings costs of training are likely to be especially high for displaced workers. Forgone earnings are likely lower for economically disadvantaged workers and for teenagers and young adults, whose likelihood of being employed and earnings power are lower. The upshot is that in order to justify their higher costs of training, displaced workers must experience larger impacts (in terms of dollars gained) from retraining programs than other training participants.

Training Facilitates Job Search

A second way to characterize the training decisions of displaced workers is based on the idea that access to training may facilitate job

search. In this setting, unemployed persons seek to enroll in training because they believe that this opportunity increases their chances of receiving an acceptable job offer. What distinguishes this framework is that training may facilitate productive networking by the unemployed. The increased contacts that they experience at a training center or community college may increase the likelihood that they receive an offer of a new job. In this case, training does not increase skills but would increase employment rates and possibly wages if this networking led to better job matches between displaced workers and employers.

According to the job search characterization of training, evidence that displaced workers have high early dropout rates from training programs or community college courses would not necessarily indicate that these programs or courses were ineffective. Instead, this evidence may simply indicate that displaced workers use training opportunities to facilitate their job search and that they leave training once they are reemployed.

DETERMINANTS OF TRAINING PARTICIPATION

In order for displaced workers to make productive decisions about training participation, they need to know more than the likely impacts of training. According to the human capital framework outlined earlier in this chapter, individuals participate in training only if the benefits exceed the costs. Evidence on how different personal characteristics affect the propensity to participate in training provides information about what characteristics make individuals more likely to benefit from training.

The evidence that we present in this chapter on the determinants of displaced workers' decisions to participate in training comes from studying all persons displaced from UI-covered jobs in Washington State during the first half the 1990s. The evidence is largely based on the subsample of persons who filed a valid claim for unemployment insurance benefits following the loss of a job that they had held for at least six quarters, and who were consistently attached to the state's workforce during the period that we studied. Our sample is unusually large for this kind of study, containing over 121,000 persons.

The workforce attachment restriction reduced our sample by nearly one-half. One implication of this fact is that many displaced workers, including those who attend a community college around the time of their job loss, do not remain consistently attached to the state's UI-covered workforce. We find that such persons are more likely to be women and to be older. Neither of these groups are known for high rates of geographic mobility and are likely to still be residing in the state after their displacements. Therefore, if policymakers subsidize training for the purposes of raising worker productivity, a significant amount of community college schooling must generate extremely low returns because many participants do not work very often following training.

Nonetheless, our results on the propensity to participate in training are not sensitive to our restricting the sample to displaced workers who remain consistently attached to the state's workforce. In results reported elsewhere, we find that the influence of factors that are associated with community college participation among displaced workers who remain consistently attached to the state's workforce is the same as it is for displaced workers who are not consistently attached to the state's workforce following their job loss (Jacobson, LaLonde, and Sullivan 1999).

The training that we consider here are courses at 25 of Washington State's community colleges in which dislocated workers enrolled around the time of their displacements. About one-fifth of our sample, or approximately 25,000 persons, enrolled in at least one community college course around the time of their job loss. We define the period around the individual's job loss to encompass the three quarters leading up to the quarter that they separate from their employer and the 11 quarters following the quarter of their job loss. Our sample consists primarily of prime-age workers, so the participation behavior and impacts that we report here are for a population that is not often studied in this literature. The average age of our sample members is approximately 37, and their wage rate prior to the quarter of their job loss was about \$18 per hour.

Washington's dislocated workers were not restricted in making choices about their selection of courses or which colleges to attend. In particular, there were no entrance restrictions based on education levels or prior success in school. However, schools did enforce the usual prerequisites for attendance in more advanced courses. There also were no

requirements to enter a degree- or certificate-granting program, but only a very small fraction of workers in our sample appeared to pursue a new credential.

Dislocated workers were aided in attending school by low in-state tuition, as well as counseling programs, particularly those supported by unions and firms in the aerospace and timber industries. Some workers obtained financial support through JTPA, but very few qualified for substantial amounts of federal Pell Grants or Stafford Loans. Perhaps most important, starting in late 1992, Washington State routinely permitted UI recipients to attend school without having to satisfy any requirement to search for work. In addition, in 1994, the state began funding a special program that provided financial assistance to community colleges that expanded their enrollments of displaced workers and developed new, more relevant curricula.

We found that nearly one-half of Washington's displaced workers who enrolled in community college courses dropped out or otherwise did not complete a single course with a passing grade. As a result, only 11 percent of the state's displaced workers completed one or more community college courses around the time of their job loss. These students who completed at least one course acquired on average 28 community college credits. The state's community college system operates on a quarter system in which the typical course is worth five credits and an associate's degree requires 90 credits. Hence, even among this subset of trainees, the average number of credits obtained amounts to slightly more than one-half of a year of full-time schooling.

We also considered the types of courses completed by displaced workers. Of the 28 completed credits, approximately 12 were completed in courses teaching more technically oriented vocational skills or in academic math and science classes. These courses included those teaching skills in the health fields, such as a respiratory therapist or a dental hygienist, and in the construction trades.

In our analysis, we found that these types of courses generated larger earnings impacts. As a result, we refer to them as "high-return" classes. We arrived at this grouping of courses after we first considered the returns associated with courses in nine different subject areas. From this analysis it was apparent that the impacts of community college schooling were concentrated entirely in a subset of these subject areas. Within these particular subject areas, completing more courses was associated

with increased earnings. We refer to all other courses as “low-return” classes. These courses included academic courses in the humanities and social sciences, as well as relatively nonquantitative vocational courses.

As shown in Table 7.1, the distribution of completed credits among displaced workers is skewed. Approximately one-half of those who complete at least 1 credit complete no more than 10 credits. This amounts to about two classes. The table also indicates that most displaced workers completed 10 or fewer credits in high-return classes. The main point is that very few displaced workers who enroll in com-

Table 7.1 Total Credits Completed by Washington State Displaced Workers

All community college credits

	Mean number (std. dev.)	Number of completed credits (% distribution)					
		1–5	6–10	11–20	21–40	41–75	76+
Males	28 (30)	0.27	0.15	0.16	0.17	0.15	0.10
Females	25 (28)	0.32	0.15	0.15	0.14	0.15	0.08

By type of community college credits

	Mean number (std. dev.)	Number of completed credits (% distribution)			
		0	1–5	6–20	21+
Group 1 ^a					
Males	15 (23)	0.30	0.23	0.22	0.24
Females	9 (15)	0.42	0.25	0.20	0.13
Group 2 ^b					
Males	13 (19)	0.31	0.22	0.27	0.20
Females	16 (21)	0.18	0.27	0.29	0.27

^a Group 1 credits are from courses teaching more technical academic and vocational skills.

^b Group 2 credits are from all other courses, including basic skills classes.

SOURCE: Authors' calculations from a sample of workers dislocated from UI covered jobs between 1990 and 1994. Each worker had filed a valid UI claim, accumulated at least six quarters of tenure with his or her former employer, and had remained consistently attached to the state's workforce during the period that we studied.

munity college courses complete enough classes to obtain even a certificate. If community college schooling is a productive investment, it must be because of the benefit stemming from completing only a few courses.

Determinants of Training Participation

As we discussed in the previous section, evidence that displaced workers who possess particular characteristics are more likely than others to receive training suggests that these types of persons are more likely to view the benefits of training as outweighing its costs. We begin by considering how different personal characteristics are associated with the rates that displaced workers enroll in and complete community college schooling. In our analysis, we hold constant differences among individuals' gender, whether they are non-Hispanic whites, their age at displacement, prior schooling levels, years of service with prior employer, prior industry, whether their prior employer was located in the Seattle metropolitan statistical area (MSA), the state's other MSAs, or the rural regions of the state, the year and calendar quarter of displacement, and earnings prior to displacement.

We summarize our analysis in Table 7.2. As shown in the first row of the table, women's enrollment rates are eight percentage points greater than observationally similar males. In other words, if we were to observe a sample of male and female displaced workers who were all non-Hispanic whites, the same age, the same number of years of prior schooling, the same tenure at displacement, who were displaced from the same industry, located in the same region of the state, and at the same time, we would predict that the enrollment rates of the women would be eight percentage points greater than those of their male counterparts. Given that the average enrollment rate for the entire sample is approximately 20 percent, this impact is substantial. In the second column of the table, we observe that women also are more likely than males to both enroll in and complete some community college schooling. The gap in training rates between the genders is four percentage points. Given that the average training rate for the entire sample is 11 percent, this impact also is substantial. These results indicate that displaced females are more likely than males to view training as beneficial either as a vehicle to improve their skills or as a vehicle to facilitate their job search.

Table 7.2 Impact of Demographic Characteristics on Enrollment and Training Rates of Displaced Workers in Washington State (percentage point difference)

Characteristics	Enrollment rate ^a	Training rate ^b
Females vs. males	8	4
Non-Hispanic whites vs. minority	-2	1
Age at displacement (yr.)		
22-24 vs. 55-60	12	9
25-29 vs. 55-60	9	6
30-34 vs. 55-60	7	5
35-39 vs. 55-60	6	5
40-44 vs. 55-60	6	4
45-49 vs. 55-60	5	3
50-54 vs. 55-60	3	2
Prior education		
High school dropout vs. some college	-8	-8
High school graduate vs. some college	-6	-5
College graduate vs. some college	-4	-4
Tenure at displacement		
3-6 yr. vs. 1.5-3 yr.	1	1
6 or more yr. vs. 1.5-3 yr.	3	3

NOTE: Workers displaced during 1990 through 1994 from UI covered employment in Washington. Because of our sample is large, these results are generally statistically significant at conventional levels of statistical significance. For information on the standard errors associated with these estimates see Jacobson, LaLonde, and Sullivan (1999).

^a The "enrollment rate" measures the percentage of persons who enrolled in a community college course during the period between three quarters prior to the quarter of their jobs loss until the 11th quarter after their job loss.

^b The "training rate" measures the percentage of displaced workers who enrolled in and completed at least one community college credit around the time of their job losses.

The reason that women complete more training than men is that they are more likely to enroll in community college courses in the first place. However, once they enroll, they are not more likely than are their male counterparts to complete a course. Indeed, we find that among displaced workers who enroll in community college courses, women are, if anything, less likely to complete at least one course.

This finding suggests that the factors which determine and motivate displaced workers' enrollment decisions may differ from their decisions to complete training. In light of our previous discussion about the varied motivations for training participation, this finding is not surprising.

Turning to the second row of the table, we observe that the enrollment and training rates of both minority and non-Hispanic white displaced workers are similar. The results indicate that non-Hispanic whites are slightly more likely to complete some training, while minorities are more likely to enroll in community college courses following their job loss. In work not summarized in the table, we find that the reason for this result is that although minorities are more likely to enroll in community college schooling, once they have enrolled they are approximately 15 percent less likely to complete at least one course. Although this result may suggest that minorities have more difficulty adapting to a classroom training environment, this may not be the correct interpretation of this finding. As our discussion in the previous section suggested, the networking opportunities associated with being at a community college may be greater for minorities, whose transition rates from unemployment to new jobs in the absence of training are usually lower than are those of whites.

Beginning in the third row of Table 7.2, we observe that participation in training declines with age. Enrollment and training rates are the largest for the youngest displaced workers in their early twenties and decline with age. The probability that displaced workers in their early twenties enroll in community college courses is approximately 12 percentage points greater than observationally similar workers who are in their late fifties. Participation rates drop sharply with age until individuals are in their mid thirties. At this point participation rates decline slowly but steadily as individuals approach their sixties. As shown in the table, the enrollment rates of displaced workers in their thirties and forties is approximately 6 percentage points greater than the enrollment rates of displaced workers in their late fifties. This difference implies that the enrollment rates in community college schooling is approximately one-third less for displaced workers in their late fifties compared to those in their thirties and forties.

This relationship between displaced workers' ages and participation rates in training is consistent with the human capital rationale for

training. Younger displaced workers are more likely to enroll in training because their forgone earnings are likely lower and they have a longer time frame to realize returns to their investments. At the very least, our findings indicate that displaced workers who are older have less incentive to participate in training or perhaps encounter greater barriers to acquiring skills through community colleges.

One of the most interesting sets of results in the table is the relationship between displaced workers' prior schooling and their participation rates in community college. The displaced workers who are most likely to enroll in these courses are those who previously had acquired some postsecondary schooling. Enrollment and training rates among high school graduates are approximately 6 and 5 percentage points lower, respectively, than those with some postsecondary schooling. The gap between high school dropouts is even larger. Further, those with some prior postsecondary schooling also are more likely to receive training than those with college degrees.

The foregoing relationship between displaced workers' prior schooling and training participation also holds among the subset of displaced workers who enroll in at least one community college course. In results not reported in the table, we find that displaced workers with some prior postsecondary schooling are approximately 33 percent more likely to complete at least one community college course than high school dropouts who enroll in courses. They also are more likely to complete at least one course than enrollees who have only a high school degree or who have a higher degree.

These results suggest that community college retraining is more attractive to displaced workers with prior postsecondary schooling than it is for other dislocated workers. Because we account for many productivity-related characteristics, such as individuals' prior industry, years of service, and earnings, our result implies that among workers with approximately the same productivity, those who had acquired some prior postsecondary schooling benefit more from community college retraining. Further, since we attempt to account for the magnitude of displaced workers' earnings losses in our analysis, it is unlikely that differences between individuals' forgone earnings could explain our result. Instead, our result suggests that displaced workers with prior postsecondary schooling are a good match for community college-based retraining.

There are a couple of reasons why displaced workers with prior postsecondary schooling may find attending community colleges to be an attractive option following their job loss. First, the emotional costs associated with enrolling in community college courses may be less for displaced workers who acquired this type of schooling in the past. An advantage that these displaced workers have is that they know more about community colleges and their programs. Second, these individuals also may benefit more from returning to school than those with postsecondary degrees or those who have no more than a high school education, because they may be able to quickly obtain a degree or some other credential. This possibility would influence displaced workers' training decisions if employers viewed having a credential as an important factor when making hiring decisions. However, when we took into account the number and type of credits displaced workers completed, we did not find evidence that obtaining a degree worked to their advantage.

What Determines the Number of Completed Credits?

Another measure of displaced workers' participation in retraining is how intensely they participated in community college schooling. To address this question, we examined how the personal characteristics of displaced workers predicted the number of credits that they completed in Washington State's community colleges. For this analysis we limited our sample to displaced workers who completed at least one course. As we noted above, this group of trainees completed on average approximately 28 credits.

We found that the personal characteristics that are associated with greater participation rates in retraining also are associated with greater intensity of participation. However, these relationships are often not very strong. Accordingly, these results highlight the importance of the enrollment decision in explaining differences in the amount of training acquired by displaced workers. As shown in Table 7.3, women complete on average two more credits than observationally similar men. Given that this subsample of displaced workers complete an average of 28 credits, this difference is relatively modest. By contrast, we observed above that women were substantially more likely than men to enroll in community college courses.

Table 7.3 Impact of Demographic Characteristics on the Number of Credits Completed by Displaced Workers in Washington State (difference between groups' credits)

Characteristics	Total credits	Total credits	
		Males	Females
Females vs. males	2	—	—
Non-Hispanic whites vs. minority	2	3	1
Age at displacement (yr.)			
22–24 vs. 55–60	6	5	8
25–29 vs. 55–60	7	5	9
30–34 vs. 55–60	7	6	7
35–39 vs. 55–60	8	7	8
40–44 vs. 55–60	7	5	8
45–49 vs. 55–60	4	3	5
50–54 vs. 55–60	3	2	4
Prior education			
High school dropout vs. some college	–4	–6	–2
High school graduate vs. some college	0	0	0
College graduate vs. some college	–6	–6	–6
Tenure at displacement			
3–6 yr. vs. 1.5–3 yr.	3	3	2
6 or more yr. vs. 1.5–3 yr.	4	3	4

NOTE: See Table 7.1 for average number of credits and description of sample. Difference between the number of credits completed by groups indicated in the rows of the table.

The relationship between the age of displaced workers' when they lost their job and the number of credits they complete also is weaker. As shown in the table, the youngest displaced workers complete six more credits than the oldest displaced workers, but they complete about the same number of credits as displaced workers in their early forties. These results indicate that young displaced workers acquire more training than their prime-age counterparts, because they are more likely to enroll and complete at least one course. However, among displaced workers who complete at least one course, age is not a strong predictor of how much training they acquire.

We reach a similar conclusion when examining the relationship between prior schooling and the intensity of retraining. Once again this relation is much weaker than the relation between this characteristic and enrollment or training rates. Displaced workers with some prior postsecondary schooling complete approximately the same number of credits as those with a high school degree and approximately one more course than their counterparts who were high school dropouts or who had a college degree. These results indicate that the reason displaced workers with some prior postsecondary schooling receive more training is that they are more likely to enroll in community college courses and complete at least one course. Once they have completed that course, they take additional training only modestly more intensely than other dislocated workers.

IMPACT OF COMMUNITY COLLEGE SCHOOLING ON SUBSEQUENT EARNINGS

Measures of the value-added of community college courses provide information on the average impact of training. Such measures alone, however, are not sufficient to guide displaced workers' training decisions (Hollenbeck 1992; Kane and Rouse 1993; Leigh and Gill 1997). The impact of training received by displaced workers who are indifferent about participating in community college schooling, and who require encouragement from counselors, may differ from the impact for the average participant. More importantly, information about the impact of training is insufficient because training decisions depend on individuals' perceptions of both the impacts and the costs of training.

Nevertheless, before we can assess the net benefits of retraining, we must document the likely gains from community college schooling. To arrive at our estimate, we developed a statistical model of individual earnings that took account of differences among individuals' observed characteristics and unobserved characteristics that were fixed through time. Accordingly, our framework controls for differences among displaced workers' prior schooling, prior work experience, and family background characteristics that could account for differences in the amount of community college schooling that they acquire around the

time of their displacements. Further, we also account for differences in the rate of growth in earnings as a function of gender, ethnicity, and the likely size of the earnings loss that is connected with their displacements.

We identify the impact of community college schooling essentially by comparing the postschooling earnings of displaced workers who are observationally similar but who had acquired more or fewer community college credits. In this framework, information about displaced workers who did not acquire any schooling is not required to estimate the impacts of schooling, although it does help us obtain more precise estimates.

Average Impact of Community College Courses

As shown in Table 7.4, male displaced workers who acquired community college schooling around the time of their displacement saw their annual (long-term) earnings rise by approximately \$24 per completed credit. For females we estimate an impact of \$20 per completed credit. Therefore, a male displaced worker who completed the average number of credits (among those who completed at least one credit) experienced an earnings increase of approximately \$672 (\$24 per credit \times 28 credits). The average annual earnings of these displaced workers in the postdisplacement period was approximately \$20,000. Hence, this impact of retraining constitutes approximately 3–4 percent of total earnings.

Turning to the impacts of community college schooling for selected demographic groups, we observe that minority men benefited less from the training that they received than white men, whereas among women the impacts for minorities and whites were about the same. Community college schooling increased the earnings of very young displaced workers by more than the earnings of their older counterparts. This result is consistent with our earlier finding that younger displaced workers are more likely to participate in training.

The values in Table 7.4 also suggest that the estimated impact of community college schooling is larger for those who are more experienced and better educated to begin with. In general, low-tenure displaced workers are less productive than their counterparts with longer tenure with their former employers. Among those who had acquired

Table 7.4 Impact of Community College Credits on Annual Earnings

Group	Males (\$)	Females (\$)
Total	24	20
Demographic group		
Minority	8	20
Age 22–24	32	36
Less than six years' tenure	16	12
More than high school degree	28	28
Type of course		
High-return courses ^a	64	68
Low-return courses ^b	-36	-12

NOTE: This table shows the average impact of a completed credit on earnings three years after completing last community college course.

^a More quantitative vocational courses or academic math and science courses.

^b All other courses including less quantitative vocational courses or humanities and social sciences courses.

SOURCE: Authors' calculations based on Washington State administrative data (see Table 7.1). For information about the standard errors associated with these estimates, see Jacobson, LaLonde, and Sullivan (1997, 1999).

relatively little tenure, the estimated impact of a community college credit is approximately one-third less than the average impact for all displaced workers. Similarly, we find that the impact of schooling is modestly higher among displaced workers who had more prior schooling. These results help to explain why high-tenure displaced workers with more prior schooling are more likely to participate in training, despite probably having higher costs of participation.

Despite these positive earnings gains, our results indicate that community college schooling usually helped displaced workers offset only a fraction of the losses associated with their displacements. Trainees completed on average about one-half of a year's worth of community college schooling. We observed above that this investment subsequently translated into an approximately 3–4 percent earnings increase. Extrapolating further, we would expect one year of community college schooling to raise the typical displaced worker's earnings by about 6 percent. In our sample, it is unusual for displaced workers to complete this much schooling. As other research has shown, however, long-term

earnings losses associated with displacement range from 15 to 25 percent per year and can be larger for workers from some industries (Ruhm 1991; Jacobson, LaLonde, and Sullivan 1993; Schoeni 1996). Therefore, our results suggest that it would take three to four years of full-time community college-style retraining in order for displaced workers to obtain the skills necessary to offset the long-term losses associated with displacement.

Average Impact of Different Types of Courses

Our analysis of community college schooling indicates that it can generate modest earnings impacts for a variety of displaced workers. However, as we analyzed our results more closely, it became clear that the impact of community college schooling resulted almost entirely from large impacts associated with courses in the health-related fields, in more technically oriented vocations including the trades, and in academic math and science classes. As shown by Panel C, the impact of community college schooling appears to depend more on the types of courses that individuals complete than on their characteristics. Displaced workers who complete what we call high-return courses experience very large earnings increases per completed credit. Extrapolating from the values in the table, we estimate that a displaced worker who completed 15 high-return credits (just three to four courses) experienced nearly a \$1,000 rise in their annual earnings.

All other categories of courses, including those that taught less technically oriented vocational skills or academic subject matter, usually generated small or even negative earnings impacts. These results imply that such courses probably make displaced workers financially worse off. Indeed, male displaced workers appear to be made substantially worse off on average by enrolling in school and completing low-return courses. This result could be spurious if displaced workers who experienced larger earnings losses in connection with their job losses also tended to complete more low-return courses. However, our statistical framework takes this possibility into account. One way to interpret our finding for low-return courses is that when displaced workers invest in such training, they not only may fail to acquire any productive skills, but they also may lose valuable labor market experience.

To explore further our finding about the adverse impacts of low-return courses, we limited our analysis to the subsample of displaced workers who had completed 15 or more high-return credits. This group of displaced workers was on average more skilled than other training participants. We then asked whether this more skilled group experienced any earnings gains from completing low-return courses? Once again, we found that even among this group of displaced workers, the numbers of low-return courses completed were not associated with increased earnings. We interpret this result as strong evidence that our findings on the disparate impacts of high- and low-return courses are not due to differences in the types of individuals who enroll in these kinds of classes.

The impacts of high-return courses that we report here help explain why more productive and younger displaced workers experience larger average impacts of schooling. We find that both more-skilled displaced workers and younger displaced workers are more likely than other displaced workers to enroll in such courses. Consequently, they gain more from training partly because they complete training in areas that are better rewarded in the labor market. These results also are consistent with a general finding in the training literature indicating a complementarity between skills and the receipt of training. In the private sector, employers are much more likely to train their most skilled workers, probably because the gains from training are largest for this group.

PROGRAM PERFORMANCE AND INDIVIDUAL DECISION MAKING

Whether displaced workers' retraining is likely to pay off depends on the types of courses that they complete and the costs that they incur in order to be retrained. As we observed in the previous section, a displaced worker choosing to complete low-return courses is likely to be worse off as a result of participating in training. Individuals unaware of this tendency would make better decisions, if they received this information around the time of their displacements. By contrast, those who complete some of the high-return courses may benefit from training, depending on its costs.

To assess whether the benefits of high-return courses likely exceed their costs, we consider a hypothetical example. Suppose that a displaced worker enrolled in community college courses for one full academic quarter. During that quarter, she completed 15 credits in high-return classes. We estimate above that this training might increase her annual earnings by an average of \$1,000 per year. If this displaced worker could expect to earn \$20,000 a year in the absence of training and she loses one-quarter of that pay because she enrolls in school full time, then the forgone earnings cost of her retraining is about \$5,000. Alternatively, if she works part time while going to school, the forgone earnings cost of her retraining might be closer to \$2,500. We also assume that the cost of tuition, fees, transportation, and child care amounts to \$2,000. Ignoring the emotional costs of training, total training costs for the trainee who works part time amounts to \$4,500. The question now becomes, is a \$1,000 annual impact sufficient to justify a \$4,500 investment in training? The answer is that it depends. If the displaced worker is relatively old, her working career may not be long enough for the impacts to offset the costs. Further, if a displaced worker's newly acquired skills depreciate, over time her annual earnings impacts from this retraining will diminish so that the cumulative impacts may be insufficient to cover the cost of retraining.

The answer also depends on how we discount the future earnings gains from retraining. We must discount future gains because a \$1,000 gain in earnings ten years from now is not worth the same to an individual as a \$1,000 gain in earnings one year from now. If we use an interest rate of 5 percent, an individual should be indifferent between receiving \$1,000 ten years from now or \$614 today.

In this example, we discount future gains according to a rate of 5 percent. We also assume that during the first year after leaving training, displaced workers did not experience any earnings gains. We impose this assumption because we found in our study, that earnings impacts during the first year after training were often either negative or zero.

We now consider the calculation of net benefits of high-return community college courses for four hypothetical displaced workers whose ages were 25, 35, 45, and 55 when they lost their jobs. We also show how the calculation is sensitive to assumptions about the depreciation rate of displaced workers' newly acquired skills by assuming 1) no skill

depreciation, and 2) a 5 percent rate of skill depreciation. In Table 7.5, we present the net benefit calculation based on these assumptions. In the third row, we report the adjustment that we make to annual earnings gains to account for 1) these gains continuing through the remainder of a person's career, 2) the possibility that the skills acquired in community college courses depreciate, and 3) the discount rate. The present value of the gains from schooling at the time a displaced worker makes the decision to enroll in courses is given by the product of the average annual impact times the adjustment factor. The net benefit of schooling is the difference between the total impact and the costs.

As we can see from Table 7.5, if newly acquired skills do not depreciate, the net benefits of retraining for all but the oldest displaced workers are very substantial. The net present value for a 35-year-old, the approximate mean age of our sample of displaced workers, completing an academic quarter of high-return courses is \$14,400. Given the assumed costs of this retraining, this gain implies an (internal) rate of return on investment of approximately 20 percent. Even by the standards of the late 1990s stock market, this gain is substantial. By con-

Table 7.5 Computing the Net Benefits of High-Return Community College Courses

Variable	Age at displacement							
	—25—		—35—		—45—		55	
Annual impact (\$)	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Depreciation rate (%)	0	5	0	5	0	5	0	0
Adjustment factor ^a	16.2	8.4	14.4	8.1	11.5	7.3	6.8	
Total impact ^b (\$)	16,200	8,400	14,400	8,100	11,500	7,300	6,800	
Costs (\$)	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Net benefit (\$)	11,700	3,900	9,900	3,600	7,000	2,800	2,300	

NOTE: The calculations are based on a discount rate of 5% and an assumption that individuals' working lives end when they are 65.

^a These numbers are the product of the annual impact and the adjustment for the time value of money, skill depreciation, and years left in career.

^b The adjustment factor accounts for the time value of money, skill depreciation, and years left in career.

trast, the same \$1,000 gain in annual earnings translates into a smaller \$6,800 present value for displaced workers in their mid fifties. If the forgone earnings associated with training participation were double their assumed levels, the net benefit of completing an academic quarter of high-return courses would be negative. Under these circumstances, older displaced workers would be better off not enrolling in training.

The foregoing calculations in Table 7.5 depend on several assumptions. We assumed that skills did not depreciate. Some analysts of private sector training have reported evidence of skill depreciation (Lillard and Tan 1992). If the value of newly acquired skills depreciate at a rate of only 5 percent per year, the net benefit of retraining declines substantially. As shown in Table 7.5, the present value of the gain for a 35-year-old displaced worker falls from \$9,900 to only \$3,600.

Another important assumption underlying our calculations concerns how much displaced workers would have earned had they not been in school. In a depressed labor market, the likelihood of receiving a job offer may be so low that the forgone earnings associated with retraining are insubstantial. By contrast, the cost of retraining displaced workers is greater when labor markets are tight and unemployment rates are low, as they have been during recent years. If there are no forgone earnings costs associated with training, the net benefits of retraining would rise by an additional \$2,500 for each age group in the table. The internal rate of return from training also would then rise substantially for each group. Nevertheless, an important point to recognize is that even if the retraining costs depicted in the table are too large, the net benefits are always larger for younger displaced workers.

We believe in general there are some forgone earnings costs associated with retraining. In our data, we find that displaced workers earn less when they are enrolled in school than when they are out of school. Those who enroll in community college courses earn less than observationally similar persons who did not enroll in such classes. Further, those who enroll in more courses during any given time period earn less than their counterparts who enroll in fewer courses (Jacobson, LaLonde, and Sullivan 1997). On one hand, this evidence may indicate that those who train more intensely are those who had not yet received an acceptable job offer. On the other hand, it also may indicate the potential for substantial forgone earnings costs associated with retraining.

CONCLUDING REMARKS

The preceding discussion outlines a framework that program operators, counselors, and displaced workers can use to assess whether retraining in a college environment is likely to raise earnings. We have contended in this chapter that policymakers can enhance program performance not only when program operators understand the benefits of training, but also when individuals themselves have better information to make more informed decisions. Displaced workers who are contemplating retraining should be aware of all the costs of their decisions as well as the benefits that they are likely to receive from different curricula.

By having this information, dislocated workers are likely to direct their energies toward more productive activities, which may include forgoing training and focusing on a job search. For many displaced workers, policies designed to facilitate reemployment are likely more beneficial than those designed to encourage retraining. Among those displaced workers who opt for retraining, policies that encourage more-skilled persons to acquire more quantitatively oriented skills are likely more beneficial than those that encourage them to acquire less quantitative or more general skills.

Although our results indicate that the subset of high-return courses generate substantial gains for displaced workers, this finding does not imply that those displaced workers who are inclined to enroll only in less quantitative courses would experience the same large returns if instead they enrolled in the high-return courses. Our results measure the impact of high-return courses among those displaced workers who actually enrolled in them. Indeed, our findings suggest that because these persons were more skilled to begin with—more tenure with their former employer and higher predisplacement earnings—they would experience higher returns from these types of classes. We would expect that those inclined to enroll only in the low-return courses would not experience gains as large if policymakers encouraged them instead to enroll in more high-return courses.

At the same time, we should note that we found that those who benefit from the high-return classes do not appear to benefit from completing additional low-return courses. Therefore, the substantial gains that

we report in this chapter for high-return courses are not simply a result of the skills of the individual, but an interaction between the individual and the type of courses (or programs) that they complete.

Our empirical results apply to displaced workers from Washington State who enrolled in community college courses around the time of their job losses in the early 1990s. Obviously, the impacts could be different for other displaced workers in other time periods, in other parts of the country, or for those who matriculated into private training institutions. We have performed a similar analysis for workers who were displaced from firms in Allegheny County, Pennsylvania, in the early 1980s and obtained similar results (Jacobson, LaLonde, and Sullivan 1997). With the growth in popularity of vocational programs in community colleges during the last two decades, it would be surprising if the benefits associated with retraining in private institutions were substantially larger. In any event, even for individuals considering enrolling in private training institutions, our framework and results are still valuable. If applied, it would ensure that applicants for such programs are those who expected to obtain the largest net benefits from retraining.

Finally, we contend that the impact of this study on dislocated workers' decisions to enroll in community colleges and select specific courses of study would depend on the extent to which

- their personal goal is to increase their earnings power,
- the accuracy of their assessments of the returns to various courses, and
- the accuracy of their assessment of the costs of attending school.

The social value of providing this information would be highest if dislocated workers 1) do not have an accurate view of the benefits and costs of attending school, and 2) are attending school primarily to increase their future earnings.

Importantly, the value of the information to dislocated workers would be even greater if they are interested and able to excel in high-return courses. However, from society's viewpoint, the cost-effectiveness of training also would increase if policymakers and program operators simply discouraged from taking training those displaced workers who are likely to make themselves financially no better off or even worse off by attending school. One way to discourage such persons

from taking training is to provide them with accurate information about the likely costs and benefits of specific types of training. If the cost of providing this information is sufficiently low, it could constitute an exceptionally effective way to raise both the private and social returns to government-subsidized training. Such information would help individuals self-select into training in a way that would make it more likely that public training resources are directed toward those who are likely to derive the greatest benefit from retraining. Clearly, the value of providing such information should be assessed in future research.

Note

We thank Kevin Hollenbeck for comments on an earlier version of this paper. The views expressed in this paper are solely those of the authors and do not reflect those of the U.S. Department of Labor. This research has been supported by the Employment and Training Administration under contract number K-630707-00-80-30.

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Comments on Chapter 7

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The general policy issue being discussed at this conference is targeting of services. This chapter delves into the question of the appropriateness of investment in formal education at community colleges for unemployed individuals. It tangentially addresses targeting to the extent that it identifies characteristics of individuals who tend to have investment successes and the educational experiences that tend to have a payoff. In the Workforce Investment Act (WIA), as I understand it, local boards will provide individual training accounts (ITAs) to or will enter into on-the-job-training contracts for adults or dislocated workers who do not or cannot find employment after receiving core and intensive services. But also, boards are obliged to provide information on eligible training providers to *anyone* under core services. As boards implement these policies, the central questions they must address are how much and what type of information about which providers should be supplied to which individuals. Furthermore, boards need to determine the size of the ITAs—should the targeting be narrow with a relatively large voucher or wider with a relatively smaller voucher? This chapter provides some information that will be useful to boards as they wrestle with these issues; however, the information is highly limited in scope and usefulness.

Jacobson, LaLonde, and Sullivan have accessed a very rich data source on community college attendance of displaced workers in the state of Washington from 1990 to 1994. They have quarterly earnings records, unemployment insurance claimant data, administrative data from the Job Training Partnership Act (JTPA) for all persons who received community college subsidies, and data from a special survey of

community college students. The inclusions that they place on the data are as follows:

- had six or more quarters of tenure prior to separating from their employer between 90:3 and 94:1,
- had an active unemployment insurance (UI) claim one quarter after their job loss (coverage issue),
- were between the ages of 22 and 60 (inclusive) during the quarter that they separated, and
- had positive earnings during each calendar year between 1987 and 1995, except during the eight quarters following their job loss (displacement).

The last criterion is important because it cut the useable sample in half from about 250,000 to 121,000, and because it meant that individuals who never became employed (or became self-employed or moved out of state) after training are not observed or analyzed.

I liked the fact that Jacobson, LaLonde, and Sullivan use three measures of community college “behavior.” First, *enrollment* is defined as completing an application form. About one-quarter of the analysis sample enrolled in community colleges. *Training* is defined as having completed at least one course. Incredibly, less than half of the individuals in the sample who enrolled received training under this definition. In other words, more than half of the individuals who enrolled did not complete even a single course. *Intensity of training* is the number of credits completed. The conditional mean (on having completed at least one course) is 28 credits (slightly more than one-quarter of what it takes to complete an associate’s degree in a quarter system).

The authors first present and discuss estimates of equations that explain participation behavior—i.e., enrollment, conditional training, and intensity. They then determine the wage returns to each of these types of behavior, and, finally, they suggest a process and even some wording of information that is provided to individuals who encounter an employment center. Some interesting findings about the enrollment rate and training rate are as follows:

- Women are more likely than men to enroll in a community college; however, they are no more likely to complete at least one course given enrollment.
- Minorities and non-Hispanic whites are equally likely to enroll

in a community college, but minorities are less likely to complete at least one course given enrollment.

- Age has a monotonically inverse relationship to enrollment and training, although the relationship is not smooth. Individuals in their twenties are most likely to enroll and be trained; the rates are smaller but level off for individuals in their thirties and forties, and then drop off considerably for individuals in their late fifties.
- Individuals who had some prior postsecondary schooling but not a bachelor's degree (which the authors refer to as "some college") were more likely to enroll and be trained than individuals with just a high school diploma or less and individuals who were college graduates.

They suggest that their findings regarding intensity of training, i.e., number of credits completed, are similar to the enrollment and training findings, but the strength of the relationships is not as great.

What I really like about the chapter is its attention to the "full return" to formal education, not just its impacts on earnings. Usual practice in estimating the returns to education is to estimate an earnings equation that has educational variables as covariates and to call the coefficient on education the returns to education. However, as Jacobson, LaLonde, and Sullivan point out, this is the benefit side of the investment, and an accounting of costs needs to be performed in order to determine the full return on investment. They point out that attending community colleges has direct, emotional, and opportunity costs in the form of forgone wages.

In their estimates of the impact of attending community college on annual earnings, i.e., the benefit side of the equation, the authors find that the average annual impact of completing one credit is about \$20 for women and \$24 for men. At the conditional mean intensity of 28 credits, they point out that this works out to about 3 to 4 percent. Minority males earned a lower return; young individuals having more than six years of (prior) job tenure and more educated individuals earned a higher return.

In attempting to analyze the impact of particular educational experiences at community colleges on earnings, the authors make what I believe is an unfortunate choice in how they characterize curriculum op-

tions. They show that the returns to “quantitative vocational courses or academic math and science courses” are higher than the returns to “less quantitative vocational courses or humanities and social sciences courses.” It is an unfortunate choice for a variable because community college students don’t have much of an opportunity to choose courses once they have selected whether they are going to pursue an occupational or a transfer program and once they have selected which program they’re going to pursue. It would be far more useful to potential community college students to know the (average) returns to a transfer program of studies (and an Associate of Arts or an Associate of Science degree) versus an occupational program (and an Applied Associate of Science degree). Next in importance would be particular program or concentration areas (i.e., political science, administrative assistant, dental assistant, library science, etc.). My experience is that once students have chosen their program and degree option, their course selections are rather limited. They do have a choice about how quickly they pursue their program area, so sequencing patterns, or even quarters enrolled, would have been more relevant.

Furthermore, the authors say that they control for observed and time-invariant unobserved characteristics, but there must be unobserved characteristics (which must be time-varying) that are not controlled in their specification. How much one learns or benefits from a quantitative or nonquantitative course must depend on tastes, preferences, talent, quality and quantity of educational background, aptitudes, learning style, occupational awareness, and a host of other variables. I am very uncomfortable using these results to recommend that any and all individuals should pursue quantitative course work without regard to their own interests, aptitudes, and educational background.

There is a discernible change in tone and rigor in the chapter when the authors consider the cost side of the investment decision. Basically, they no longer rely on any data; rather, they present (simulated) scenarios. Their base case is a woman who pursues a community college program on a full-time basis for one quarter. They simulate a benefit of \$1,000 in annual earnings. On the cost side, they suggest that direct costs (including tuition, fees, transportation, and child care) would be \$2,000 and that forgone earnings would be \$5,000 (three months at annual earnings of \$20,000). They ignore emotional costs. Table 7.4 in the chapter shows the lifetime net benefit of this investment assuming a

5 percent discount rate, varying the annual depreciation rate of the skills learned between 0 and 5 percent, and varying the age at displacement from 25 to 35 to 45 to 55. My basic quibble here is whether the cost assumptions are realistic. Jacobson, LaLonde, and Sullivan report having extensive community college surveys, and I'm wondering what those data report in the way of direct, out-of-pocket costs to students. Furthermore, they have quarterly earnings data, so they should be able to provide mean differences in earnings between observationally equivalent students and nonstudents. I suspect that forgone earnings are very small, because most community college students are employed while attending school. Additionally, the benefit is assumed to be a one-time shift of \$1,000 in annual earnings, but the earnings advantage will most likely grow over time as trained individuals receive more on-the-job training and have higher promotion likelihoods. On the other hand, I suspect that 5 percent is a low discount rate for community college students.

The final major point I want to make is the question of the generalizability (or external validity) of these findings. Recall that they are specific to displaced workers in the state of Washington who chose or were directed into community college programs in the early 1990s. Community colleges are only one type of eligible training institution out of many types of training institutions, and displaced workers are only one type of client who will be seeking information on the benefits (and costs) to training at a one-stop employment center.

Targeting Employment Services

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2002

W.E. Upjohn Institute for Employment Research
Kalamazoo, Michigan

Library of Congress Cataloging-in-Publication Data

Targeting employment services / Randall W. Eberts, Christopher
J. O'Leary, Stephen A. Wandner, editors.

p. cm.

Proceedings from a conference held on April 29 to May 1,
1999 in Kalamazoo, Michigan.

Includes bibliographical references and index.

ISBN 0-88099-244-1 (cloth : alk. paper) — ISBN 0-88099-243-3
(pbk. : alk. paper)

1. Unemployed—Services for—Government policy—United
States—Congresses. 2. Employment agencies—United States
—Management—Congresses. 3. Manpower policy—United States
—Congresses. I. Eberts, Randall W. II. O'Leary, Christopher
J. III. Wandner, Stephen A.

HD5875.T37 2002

362.85'84'0973—dc21

2002024572

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The facts presented in this study and the observations and viewpoints expressed are the sole responsibility of the authors. They do not necessarily represent positions of the W.E. Upjohn Institute for Employment Research.

Cover design by Jan Underhill.
Index prepared by Nancy Humphreys.
Printed in the United States of America.