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## The General Educational Development (GED) Credential: History, Current Research, and Directions for Policy and Practice

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John H. Tyler

### INTRODUCTION

In 2001, the number of individuals who took the tests of General Educational Development (GED) topped one million for the first time in history. Each year since 1980, between 400,000 and 500,000 individuals have passed the exams and received their GED credential. GED certificates constituted 25% of the total of regular high school diplomas plus GED certificates issued in 2001. When this figure is limited to diplomas plus certificates issued to those under the age of 19, 10% of all “school leaving” credentials issued in 2001 were GED certificates.<sup>1</sup> In terms of numbers,

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<sup>1</sup>There were about 2,821,000 public and private high school diplomas issued in 2001, which is about 70% of the 17-year-old population that year. Meanwhile, there were about 266,800 GED certificates issued to individuals between the ages of 16 and 19. (Sources: GED Testing Service, 2001; National Center for Education Statistics, 2001).

the GED credential clearly has become a major component of the American education landscape.

The size of the GED credentialing program can be measured in dollars as well. In fiscal year 2000–2001, federal grants to the states for adult education programs authorized by the Adult Education and Family Literacy Act of 1998 totaled more than \$460 million, and these were matched by additional hundreds of millions of state dollars directed toward adult education (Office of Vocational and Adult Education, 2001b). Approximately 25% of these funds were targeted to adult secondary education programs that are largely GED preparation programs provided by public high schools, community colleges, community-based organizations, prisons, and other organizations involved in adult education (Office of Vocational and Adult Education, 2001a).

That a credential such as the GED was conceived and given a policy arena that allowed for vigorous growth is not surprising. Especially where it concerns education, the United States is a land of second chances, and the GED is the primary second-chance route for individuals who have dropped out of our nation's schools or landed on our shores lacking a high school diploma from their native country. This chapter tells the history of the GED and discusses factors associated with the enormous growth in the number of dropouts who hold a GED, the research regarding the impact of the credential on various outcomes, the important policy questions associated with the GED in the 21st century, and the questions that remain unanswered about this uniquely American education credential.

## **HISTORY AND DEVELOPMENT OF THE GED**

### **What Is the GED?**

The GED is an examination-based credential, and as such it requires no “seat time” or enrollment in any institution or prescribed course of study. One acquires a GED by passing a series of tests, not by accumulating credits or units. The purpose of the GED program is to certify the acquisition of certain levels of knowledge in five areas: mathematics, writing, reading, social studies, and science. The examinations in the GED battery are designed to test general rather than curriculum-specific knowledge in the five areas.

The GED Testing Service (GEDTS), an arm of the American Council for Education (ACE), oversees the GED testing program, producing the tests and disseminating them to state departments of education. The five tests in the GED battery take about 7 hours and 45 minutes to complete. All of the tests use a multiple-choice testing format, and the writing test also has a short essay component. There have been four generations of GED exams: the original GED tests released in 1942, the 1978 series, the 1988 series, and the current series released in January 2002.

The Commission on Educational Credit and Credentials of the ACE sets minimum passing scores on the exams. Each state education agency is, however, free to set higher passing standards if it chooses. Until 1997, this was an important consideration as many states chose higher standards than those the ACE set, generating substantial variation across states in the standard required to pass the GED exams. In 1997, the ACE raised the required minimum, and since that time, most states have had the same GED passing standard: a minimum score of 40 (out of a possible 80) on any one subtest and a mean score of 45 on the five tests. Individuals who fail the GED exams may, subject to various state-level restrictions, retake the tests. Each year, about 6 to 7 of every 10 GED candidates pass the exams and receive a GED.

The GED exams are normed on a random sample of graduating high school seniors, and the passing standard is set so that about one third of the norming sample would not meet the passing threshold. It does not necessarily follow, however, that successful GED candidates have stronger cognitive skills than one third of all graduating high school seniors because (a) members of the norming sample have little incentive to try their hardest on the tests; (b) a non-trivial percentage of successful GED candidates require more than one attempt to pass the exams; and (c) unlike the norming sample, many GED candidates have taken GED practice tests, and their scores may partially reflect test familiarity.

Each state department of education is ultimately responsible for administering, collecting, and scoring the tests, and for awarding the credential. Guidelines concerning factors such as testing conditions, locations, and times; opportunity to retest; age limitations; and residency requirements are all set at the state level. As noted earlier, states can raise the passing standard to a level higher than that set by the ACE. GED tests are administered in high schools, community colleges, prisons, church basements, and community halls. That this nationally recognized education credential is ultimately very local and decentralized is typical of the American approach to education.

## The Military Beginnings of the GED

The roots of the GED program trace to World War II. In 1942, an advisory committee to the Army Institute, headed by Ralph Tyler, selected five tests from the Iowa Test of Educational Development to form the first GED tests. The purpose of the exams was to certify that veterans returning from World War II without a conventional high school diploma had the skills to take advantage of the postsecondary education benefits provided in the GI Bill.<sup>2</sup> In essence, the tests certified that these men and women who had left school to serve the country before graduating had acquired skills in the military that were equivalent to the cognitive skills possessed by regular high school graduates. The GED was billed as a high school “equivalency” certificate. Many still think that GED is an abbreviation for “General Equivalency Diploma,” and several states have “equivalency diploma” printed on the GED certificates they issue. The extent to which GED certified individuals are, in fact and on average, “equivalent” to individuals who possess a high school diploma is an empirical question that will be explored in a later section.

The first GED tests were administered to returning veterans in 1943. The GED program was broadened in 1947, when New York became the first state to allow school dropouts who were not veterans to seek the GED credential. Other states soon followed, although relatively few dropouts sought this new credential in the early years. In 1949, 570 GED testing centers across the nation administered the tests to 39,000 individuals.<sup>3</sup> The GED was, however, about to make the transition from a relatively obscure military-related credential to the primary second-chance credential for school dropouts.

## The Growth of the GED in the 1960s and 1970s

Figure 3.1 charts the growth in the number of GED test takers from the first through the last years for which there are annualized data, 1954–2001. From a base of about 42,000 in 1954, the number of test takers per year

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<sup>2</sup>Passed in 1944 with the signature of President Franklin Roosevelt, the GI “Bill of Rights” provided various benefits to World War II and subsequent veterans, including funds for postsecondary education. In the peak year of 1947, veterans accounted for 49% of the total college enrollment in the United States ([http://www.gibill.va.gov/education/GI\\_Bill.htm](http://www.gibill.va.gov/education/GI_Bill.htm)).

<sup>3</sup>For comparison, there were about 1.6 million 12th graders in 1949 (National Center for Education Statistics, 1993).

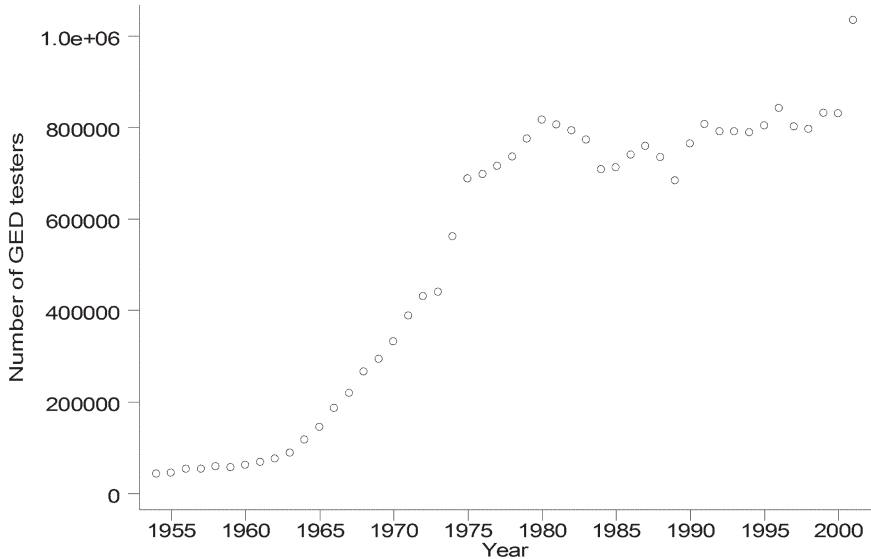


FIG. 3.1. Number of GED test takers by year, 1954–2001. Source: Various editions of the *GED Statistical Report* by the GEDTS.

grew at a stable and modest rate until about 1961 or 1962. Around 1963 or 1964, however, the rate of growth in the number of dropouts increased dramatically. In 1963, 88,000 attempted the GED exams; by 1970, more than 300,000 dropouts attempted the GED exams. By 1980, this figure reached 816,000, before leveling off for the next two decades.

Baby boom demographics associated with many mid- to late-century education trends can explain only a portion of the GED explosion. For example, if nothing changed between 1954 and 1980 other than the doubling in the number of 15- to 24-year-olds (the age range producing the bulk of GED candidates) that occurred, about 82,000 GED test-takers would have been expected in 1980 rather than 816,000.

Obviously, additional factors account for the growth of the GED program during the 1960s and 1970s. A particularly strong candidate is the increasing involvement of the federal government in issues concerning literacy, skill development, and adult education. Federal funds and programs directed at adult education were not new. In 1777, the federal government authorized funds to provide instruction in mathematics and military skills to soldiers of the Continental Army. Over the years, federal legislation led to the establishment of land grant colleges (Morrill Act of 1862), programs that provided education and vocational skills to adults not enrolled in

college (Smith-Lever Act of 1914 and Smith-Hughes Act of 1917), Depression-era education and vocational rehabilitation programs (Federal Emergency Relief Act of 1933), and a number of new services and programs in the 1950s aimed at low-skilled and low-educated adults (including the Library Service Act and the Government Employees Training Act). Nevertheless, attempts over the years to pass an Adult Education Act (AEA) had always been defeated. It was not until the mid-1960s that powerful economic and social forces led to legislation that would address the needs of adults who were poor, unemployed, unskilled, and undereducated.

In 1964, the first federal program designed specifically for adult education and literacy was created as a part of President Lyndon Johnson's War on Poverty. The Adult Basic Education Program was established in Title IIB of the Economic Opportunity Act (EOA) of 1964 (Public Law No. 88-452). This program's purpose was to initiate programs of instruction for individuals 18 years and older whose inability to read or write the English language constituted a substantial impairment of their ability to obtain or retain employment.

The Adult Basic Education Program was authorized through the Office of Economic Opportunity (OEO) but was in fact administered by the Office of Education within the Department of Health, Education, and Welfare. A number of state plans were approved and began operation in 1965. By the close of fiscal year 1966, all states had established adult education delivery systems, and federal funds, matched by state money, began to flow to adult education programs for the first time.

Figure 3.2 plots the federal dollars (in constant 1980 dollars) against the number of GED test takers for the years 1954 through 1980. As the graph makes clear, the rapid increase in the number of GED test takers coincides closely with the timing of federal dollars that began to flow to adult education programs under the AEA. This suggests a *prima facie* case that the growth of the GED program in the 1960s and 1970s was tied directly to increases in federal funding directed at adult education programs, a case made by Cameron and Heckman (1993). This argument is weakened, however, by the fact that only after a 1970 amendment were AEA monies allowed to benefit programs leading to secondary school completion (Rose, 1991). So not until 1971 at the earliest could federal monies have directly benefited GED test takers—almost 10 years after the upturn in the growth of the GED.

Another potential explanation for the rapid growth of the GED in the 1960s is the linkage between obtaining a GED and qualifying for postsecondary education loans and grants. The Guaranteed Student Loan (GSL)

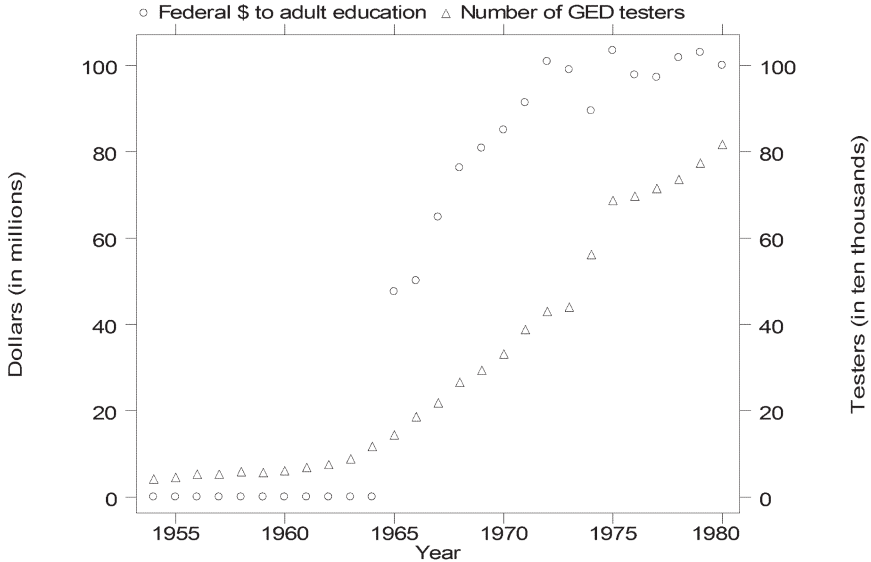


FIG. 3.2. Federal dollars (constant 1980 dollars) to adult education and number of GED test takers by year, 1954–1980. Sources: *GED Statistical Report* and National Advisory Council on Adult Education, 1980.

program was authorized in 1965, and monies from this program became available in 1966. During the 1960s, colleges increasingly recognized the GED as a valid school completion credential. For example, 91% of 2,000 higher education institutions surveyed in 1969 indicated that they accepted satisfactory GED scores for admission to college (Mullane, 2001). Thus, GED-certified individuals were eligible for the new federal monies available through the GSL program. The presence of these loans may have provided particularly strong incentives for dropouts to acquire a GED and go to college as the Vietnam War was heating up during the 1960s. In 1973, Pell Grant money became available, providing another source of financial assistance to dropouts who wanted to obtain a GED to go to college.

Figure 3.3 graphs the disbursements of GSL and Pell Grant funds by year. This graph makes it clear that these monies were generally coincident with the increase in GED testing. Two factors are important, however, when assessing the role of these programs in explaining the GED testing trend. First, as with the AEA funds, GSL funds became available 2 to 3 years after the GED trend line started rising in 1963–1964. Second, there is no available data to ascertain how many GED holders actually enrolled in postsecondary institutions during this period. More recent data

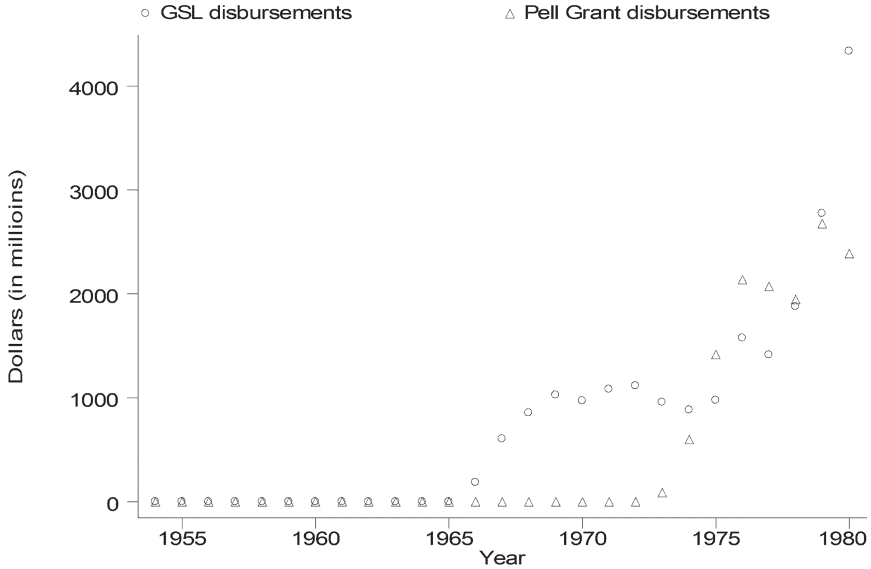


FIG. 3.3. Disbursements from Guaranteed Student Loans (GSL) and Pell Grants (constant 1980 dollars) by year, 1954–1980. Source: *Federal Student Loan Programs Data Book, FY 94–96* and *Pell Grant: 1994–1995 End of Year Report*.

cast doubt on whether the numbers could be high enough to explain much of the phenomenal growth in the 1960s and 1970s. For example, 1992 data cited in Murnane, Willett, and Tyler (2000) show that 12 years after GED holders were high school sophomores, only 30% had ever enrolled in a postsecondary institution, and only about 10% had earned as much as a year’s worth of postsecondary credits. If postsecondary enrollment patterns were at all similar for GED holders in the 1960s and 1970s, the GSL and Pell Grant programs, along with other postsecondary financial aid programs, can only explain a portion of the increased use of the GED during this period.

Figure 3.1 shows a sharp upturn in the number of GED test takers between 1973 and 1974. This increase is coincident with two factors. First, as shown in Fig. 3.3, there was a substantial increase in Pell Grant disbursements at that time, suggesting a “carrot effect” that this federal program might have had on dropouts’ decisions to obtain a GED. At the same time, however, California became the final state to adopt the GED credential with a statewide policy, increasing the pool of potential GED candidates substantially.



One factor that could help to explain the early 1960s increase in the annual number of GED test takers is the movement of the GED program into the nation's prisons and jails. In 1956, only six state departments of education allowed testing of individuals in prisons; 38 states and the District of Columbia had GED testing programs in prisons by 1966 (Mullane, 2001). There are not reliable numbers today on the number of GEDs issued to incarcerated individuals. However, Mullane's tabulation of individual level data from Florida indicates that incarcerated individuals in that state obtained about 7% of the GEDs issued between 1995 and 1998.

In 1970, amendments to the AEA reduced from 18 to 16 the age at which the AEA defined someone as an adult. This increase in the GED candidate pool can explain some of the growth in the GED that occurred in the 1970s but not in the 1960s.

Other factors could also help explain the growth in the number of GED candidates during this period. For example, social movements such as civil rights not only called on society to increase public investments in education, but also called on individuals to obtain higher levels of education. Particularly for African-American adults, increased education was seen as important to the voting rights movement and to economic equality.

Thus, there are several explanations for the GED's rapid growth between the early 1960s and 1980. Factors such as the movement of the baby boom generation through the demographic pipeline, the lowering of the AEA definition of an adult from 18 to 16 years of age, and the movement of the GED program into prisons all served to increase the GED candidate pool. On the other hand, introduction of public policies such as the AEA, GSLs, and Pell Grants provided monetary incentives to any given pool of drop-outs to pursue a GED.

Unfortunately, available data can only go so far in explaining why the GED grew as it did in the 1960s and 1970s. One can show that controlling for the effects of federal monies disbursed through the AEA and the GSL and Pell Grant programs, each standard deviation increase in the number of 15- to 44-year-olds during this period (11,000 additional 15- to 44-year-olds in the population) is associated with an additional 143,000 GED test takers. Meanwhile, controlling for the effects of the increase in 15- to 44-year-olds in the population because of the baby boom, each standard deviation increase in the federal AEA monies (\$45 million) plus Pell Grant disbursements (\$905 million) is associated with an additional 133,000 GED test takers. Together, these numbers explain about 40% of the total growth in GED test takers between 1963 and 1980, leaving substantial room for other explanations.

### **The Evolution of the GED: 1980 to the Present**

In the last two decades, both the GED tests' structure and the national guidelines for a passing score on the GED have changed substantially. The first generation of GED tests, administered from 1942 through 1978, was designed to focus on "measurement of the major and lasting outcomes of a traditional high school academic program" (Auchter, Sireci, & Skaggs, 1993, p. 2). The second generation of tests was based on test specifications defined by committees of high school curriculum specialists. Among the changes were a reduced reading load, more practically oriented questions on the math test, and a shorter total testing time (6 hours, versus 10 hours for the earlier version). A notable change occurred in the third generation of tests. For the first time, GED candidates were required to write a short essay in addition to answering multiple choice questions. Candidates had 45 minutes to compose and write an essay responding to an exam prompt. The essays were graded on writing mechanics and on how well they addressed and supported a topic. The overall testing time was extended to 7 hours and 45 minutes.

The next change in the GED testing program occurred in January 1997, when increased passing standards went into effect. Before that time, the ACE set the passing standard as a minimum score of 40 (out of 80) on any one of the five tests in the battery *or* a mean score of 45 across the five tests. Low scores for math or writing (the two tests on which GED candidates have traditionally scored the lowest) could be offset by higher scores for the other three tests, provided that the overall mean score was at least 45. After January 1997, GED candidates could no longer compensate for low math or writing scores with a strong performance on the other exams. The slightly elevated 1996 data point in Fig. 3.1 results at least partially because individuals wanted to obtain their GED before the higher 1997 standards went into place.

The fourth generation of GED tests, GED 2002, was implemented in January 2002. A panel representing the core academic disciplines of English-language arts, mathematics, science, and social studies proposed several changes to the GED tests. The important differences are that GED candidates encounter more business-related and adult-context texts across all five tests, there is increased emphasis on organization in scoring the essay portion of the writing test, and examinees are allowed to use a calculator on a portion of the math test for the first time. As with the early versions of the exams, GED 2002 was standardized and normed using a

national stratified random sample of graduating high school seniors. As in earlier versions, candidates taking GED 2002 must demonstrate a skill level that meets or surpasses that demonstrated by approximately 60% of graduating high school seniors. Thus, theoretically, passing the GED exams did not become more difficult with GED 2002. However, individuals who had passing scores on some but not all of the GED exams prior to January 2002 were not allowed to carry those scores forward; they had to take and pass all five exams in the GED 2002 series. This, along with anticipation that the GED 2002 might be more difficult than its predecessor, likely accounts for much of the increased testing volume represented by the 2001 data point in Fig. 3.1.

With the passage of the Workforce Investment Act (WIA) of 1998 (Public Law No. 105-220), the Adult Education Act was replaced by Title II of the WIA, the Adult Education and Family Literacy Act (AEFLA). A major feature of the AEFLA is its emphasis on “receipt of a secondary school diploma or its recognized equivalent” as one of the “core indicators of performance.” As the “recognized equivalent” in most cases will be a GED credential, the AEFLA further institutionalizes the GED credential in adult education. On the other hand, there is a possible tension between the goals of WIA and the practice in GED preparation programs. At least the spirit of WIA is to increase the skills of adults with low education levels so that they can more fully participate in the “information age” economy. However, many learners in GED preparation programs want to focus on direct preparation for the GED, and instruction intended to build a broader set of skills for the workplace often lacks priority.

Hand in hand with the performance indicator requirements in the AEFLA has been the National Reporting System (NRS). Developed with the support of the U.S. Department of Education, the NRS is designed to establish a national accountability system for adult education programs. Its goal is to identify outcome measures of adult education programs that are appropriate for national reporting, establish methods for data collection, develop software standards for reporting to the U.S. Department of Education, and develop training materials and activities on NRS requirements and procedures.

Viewed from one perspective, the GED program offers an example of how the NRS could collect and utilize information on adult education programs that serve other populations, such as students in adult basic education (ABE) and English for speakers of other languages (ESOL) classes. Currently, these classes satisfy NRS requirements by reporting results on pre- and post-tests. If these programs followed the GED example, each

would have a test with a recognized “passing” standard, and on meeting this standard, program participants would be awarded a certificate indicating that they could perform at a given level. The GED approach is certainly an easier way to judge program effectiveness, as it only involves counting numbers or percentages of certificates granted. The impact that a move to a certificate-granting system would have on program design, pedagogy, and, ultimately, human capital development in ABE and ESOL classes is, however, less certain.

Viewed from the opposite perspective, the impact of the NRS on adult education programs and, more particularly, GED preparation programs is as yet unclear. At the least, the NRS is focusing attention on the need for the type of data collection and analysis in adult education that has been common for years in K–12 and postsecondary education in this nation. For example, simply attaching the Social Security numbers of program participants to program records related to basic demographics, program participation, test score histories, program completion, and so forth, would allow researchers to analyze adult education programs in ways not previously possible. Research in other areas<sup>4</sup> has shown that individuals’ confidentiality can be retained even as researchers link program data to, for example, records on postsecondary education, involvement in the criminal justice system, and earnings records from the state unemployment insurance system. The ability to not only track participation patterns in adult education programs, but also link participation in and completion of these programs to later outcomes holds the promise to greatly expand understanding of how these programs affect the lives of adult learners.

The influence of another adult education effort on the GED program is also yet to be resolved. The National Literacy Act of 1991 established the National Institute for Literacy (NIFL) to consolidate, disseminate information about, and support the development of services for low literacy-level adults. In 1993, the NIFL embarked on a project called *Equipped for the Future* (EFF) to develop a consensus of what is meant by Goal 6 of the National Education Goals that grew out of the first National Education Summit in 1990. Goal 6 addresses issues related to adult literacy and lifelong learning.

The most recent outcome of the NIFL effort is the 2000 publication of *Equipped for the Future Content Standards: What Adults Need to Know and Be Able to Do*, a document that launches the implementation phase of the *Equipped for the Future* initiative (Stein, 2000). As is the case with

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<sup>4</sup>See, for example, Jacobson, LaLonde, and Sullivan (1993).

the NRS, the ultimate impact of the EFF content standards on the GED program is unclear. On one hand, the EFF-related research was probably instrumental in some of the new facets of GED 2002, such as the use of calculators and texts that are more business-related and contain more adult-context entries. On the other hand, of the 16 specific skills outlined in the EFF content standards, the GED exams directly test only four: convey ideas in writing, read with understanding, use math to solve problems and communicate, and solve problems and make decisions.

Another 1990 initiative, the Secretary's Commission on Achieving Necessary Skills (SCANS), can also be seen as a potential force in the design of GED 2002. The goal of SCANS was to encourage the continued development of a high-performance economy characterized by high-skill, high-wage employment. Chartered by then Secretary of Labor Lynn Martin, the Commission defined a set of critical skills needed to succeed in the modern workforce. These "SCANS skills" were then compiled into a 1991 report that defined a high-performance workforce as one resting on a foundation of basic skills, such as computation and literacy, and the ability to apply this knowledge. On that foundation, high-performance workers need advanced "soft skills," including the ability to work in teams, solve complex problems in systems, and understand and use technology. As with the EFF content standards, GED 2002 is closer to testing the types of skills SCANS defined than were earlier versions of the GED exams. There are, however, noticeable disconnects between GED 2002 and SCANS skills, such as measuring the ability to work in teams or solve complex problems.

### **IMPACT OF THE GED ON LABOR MARKET AND POSTSECONDARY EDUCATION OUTCOMES**

The GED program has been studied extensively in recent years. The great bulk of the research has examined the credential's economic benefits. Since its early days, the GED has carried the title of a "high school equivalency" certificate, and the earliest research into the economic benefits of the GED was aimed directly at that claim. That research asked how the labor market outcomes of GED holders compared to individuals who graduate from high school with a regular diploma. Cameron and Heckman (1993) responded to this in a study that showed GED holders were not the labor market equivalents of regular high school graduates. That is, GED holders

in this nationally representative study fared worse on virtually all measures of labor market success, including annual earnings, hourly wages, and probability of employment, than did regular high school graduates. The authors of the study were more ambivalent concerning a second question of importance: Once someone has dropped out of school, are there advantages associated with obtaining a GED? Comparing GED holders to dropouts without any credential has been the focus of GED research since the Cameron and Heckman study.

Examinations of the GED conducted up to 1998 were reviewed in a study released by the U.S. Department of Education team of Boesel, Alsalam, and Smith (1998). Their review studied GED research in three areas: the GED and labor market outcomes, the GED and the military, and the GED and postsecondary education. That the great majority of these studies is concerned with the relationship between the GED and labor market outcomes illustrates how research on the credential and outcomes not directly associated with labor market success is lacking.

GED-related research in the years since Boesel et al. (1998) has been driven in no small part by increased concerns over the plight of low-skilled, low-educated individuals in an evolving high-tech economy. This section concentrates on the post-Boesel et al. research and focuses on research examining how the GED works in the labor market. Although outcomes not directly tied to the labor market are important in their own right, the update of GED research presented here concentrates on the economic payoffs of a GED for two reasons. The first and most obvious reason is that there is very little research examining the impact of the GED on outcomes that are not directly related to the labor market. Whether or not the GED affects outcomes such as parenting skills, health, citizenship, and involvement in crime are critical questions that, unfortunately, have not been addressed by the research community. However, a more substantive reason for focusing on the economic benefits of a GED is that many dropouts pursue the credential because they believe it will lead to better labor market outcomes. In the latest survey of dropouts taking the GED, 30% identified "employment" as their reason for taking the GED (GED Testing Service, 2001). Another 66% indicated "further education" as the reason, and presumably many of these individuals are interested in extra education because of the expected labor market payoffs associated with higher levels of education.

The extent to which the GED actually improves labor market outcomes is, of course, an empirical question, but one with a substantial body of evidence. The discussion that follows emphasizes four new lessons from

that literature that address the following questions: Does the GED program induce students to drop out of school? Which dropouts experience the economic benefits of a GED? What is the timing of economic benefits associated with a GED? How important is it to use the GED as a gateway to further education and training?

### **Linking the GED to Labor Market Outcomes: Theoretical Mechanisms**

The GED can affect the labor market success of dropouts directly, indirectly, or both. An obvious direct linkage between GED acquisition and better labor market outcomes derives from human capital theory. For students with weak cognitive skills, studying to pass the GED exams could lead to increases in skills that the labor market values and rewards. There is an expected strong correlation between the time spent studying for the GED and the amount of human capital accumulation. Unfortunately, there is little evidence related to the amount of time that adult learners spend preparing to pass the exams. The only direct evidence on GED study time comes from a 1989 GEDTS survey that found the average GED candidate spent only about 30 hours preparing for the exams (Baldwin, 1990). However, there is a long right-hand tail to this distribution, meaning there are some candidates who spend many hours preparing. Presumably these are dropouts with low skill levels, individuals who may experience substantial increases in human capital as they try to raise their cognitive skills to a level that will allow them to pass the GED exams. Also, it may be the case that individuals for whom English is a second language, including large numbers of immigrants, spend a considerable time improving their English language skills in preparation for the tests.<sup>5</sup>

Market signaling theory provides a second direct mechanism through which acquisition of a GED could result in better labor market outcomes (Spence, 1973). According to market signaling theory, employers lack perfect information on the skills of their job applicants and, as a result, will use “signals” of productive attributes in hiring and wage assignment if such signals exist. The GED may serve as such a signal in a pool of job applicants who are dropouts. If employers have found that GED holders are more productive employees than dropouts who lack the credential, in

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<sup>5</sup>The GED is offered in Spanish and French. In 2000, about 5% of the 830,000 tests taken were taken in Spanish, whereas only .1% were taken in French (GED Testing Service, 2001).

the absence of better information, employers might use the GED as a signal of hard-to-observe productive attributes, such as motivation, dependability, or commitment to work. If this were the case, we would expect employers to hire GED holders before they hired observationally similar uncredentialed dropouts, and/or give them better jobs with higher wages or jobs in which earnings may start low but grow faster over time.

The GED could also indirectly result in better labor market outcomes for dropouts if acquisition of the credential led to more postsecondary education or training, which, in turn, led to increases in earnings. Application to most postsecondary academic programs and many vocational training programs requires a high school diploma as evidence of secondary school completion, and most of these programs allow the GED to serve as this evidence. Also, postsecondary education Pell Grants and federal student loans stipulate that applicants demonstrate the “ability to benefit” from postsecondary education. Many dropouts use the GED to satisfy the “ability to benefit” criterion.

To this point, the discussion has focused on potential positive impacts of GED acquisition. There is, however, at least one way in which acquisition of this credential could have a negative impact on dropouts’ future labor market outcomes. Some have proposed that the promise of obtaining a GED may induce individuals who would have otherwise benefited from a high school diploma to drop out of high school. To the extent that this is the case, we would expect dropouts’ future labor market outcomes to be worse than they would have been if the GED did not exist as an option.

## **Early Research**

The most consistent result emerging from the Boesel et al. (1998) review is that GED holders fare worse in the labor market than regular high school graduates. “The Nonequivalence of High School Equivalents,” a 1993 study by University of Chicago economist James Heckman and his (then) student Stephen Cameron, is seen by many as the benchmark study comparing GED holders to individuals who graduate from high school with a regular diploma. That line of literature consistently finds that GED holders have lower hourly wages and earnings, work fewer hours, and have lower postsecondary completion rates than do individuals who graduate from high school with a regular diploma. These results focused researchers’ attention on a second question: How do GED holders fare when compared to other dropouts who have no credential? Boesel et al. (1998) revealed three regularities on this question. First, GED holders



come from more advantaged backgrounds than uncredentialed dropouts,<sup>6</sup> complete more years of schooling before dropping out, and have higher cognitive skill levels than dropouts without a GED. Second, GED holders have higher estimated wages and annual earnings than uncredentialed dropouts. Third—and most important for understanding the context of the research that was to come—after controlling for observational differences between GED holders and uncredentialed dropouts, the wage and annual earnings advantages of GED holders become much smaller and often statistically insignificant. Thus, as of 1997, there was no clear evidence in the research that GED holders fared any better in the labor market than uncredentialed dropouts. Researchers tackled this question in the years following the Boesel et al. (1998) review, and again a series of regularities emerged.

### Recent Research

The most recent research on the economic benefits of the GED is contained in 16 different post-1998 studies, and the lessons from this research can be grouped into four areas. Some of the lessons from recent research support and extend what was learned in the earlier Boesel et al. (1998) synthesis, and some of the most important results either diverge from the earlier work on the GED or represent new lines of research on the GED.

***Lesson 1: There Is Some Evidence That the GED May Encourage Some Students to Leave School Early.*** There is substantial interest on many fronts in determining whether or not having an alternative credentialing system encourages students to leave school who would otherwise remain in school and obtain a high school diploma. Data from the GEDTS and the Common Core of Data indicate an increasing number of GED recipients along with a decreasing number of regular high school graduates during the 1990s (Chaplin, 1999). Past research comparing the labor market value of a GED to a high school diploma makes this a critical issue. In terms of anticipated labor market success, the best choice for the average student is to finish high school. It follows that a policy or program that tends to reduce the likelihood of this outcome may be individually and socially counterproductive. Many have worried that the GED alternative credentialing is such a program.

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<sup>6</sup>For example, GED holders tend to come from families with higher incomes and have parents with higher levels of education than uncredentialed dropouts.

Only three papers have addressed this important question. Agodini and Dynarski (2000) use a simple human capital model of individual investment in education to examine the potential tradeoffs involved in dropping out of school and remaining uncredentialed, dropping out and obtaining a GED, and staying in school until graduation. This primarily theoretical paper suggests that a high school diploma is the optimal choice for students who place a relatively high value on future earnings, relative to potentially lower present earnings. A GED credential is the optimal choice for students who place a medium to low value on future earnings, relative to present earnings, especially if the student is behind grade level or can work at least half-time while preparing for the GED. Dropping out is the optimal choice for students who place a low value on future earnings, especially if the student can only work half-time or less while preparing for the GED.

The Agodini and Dynarski (2000) model is useful for exploring the potential outcomes that might result if policies were designed to offset this trend. For example, the Agodini and Dynarski model suggests that raising the age at which an individual could obtain a GED from 16 (the minimum age allowed in several states) to 20 or 21 everywhere could be counterproductive. The optimal choice for many students under a more stringent age limitation would be to drop out and remain uncredentialed rather than to stay in school. Instead, they suggest that policies to reduce the number of students behind grade level would be more productive in reducing the number of students who may drop out to obtain a GED. The rationale in their model is that being behind grade level increases the personal costs of graduating from high school.<sup>7</sup> The work of Agodini and Dynarski focuses attention on the fact that simply making the GED harder or more costly to obtain may not be effective in reducing the trend toward choosing a GED over completing high school.

These authors also point out, however, that it is misguided to emphasize the GED as an “end product.” Ideally, the credential should be viewed as one step in a human capital accumulation process. This suggests a more concentrated effort on policies that leave GED recipients better prepared for the labor market. Agodini and Dynarski suggest that by linking the GED program to other institutions or organizations, GED preparation programs could serve as platforms for providing additional learning opportunities, be they postsecondary academic education or vocational education and training.

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<sup>7</sup>There is an established literature in education on students who are behind grade level. See, for example, Shepard and Smith (1989).

Papers by Chaplin (1999) and Lillard (2001) also address whether and to what extent the GED option may induce dropping out of school. Analyses in both papers provide estimates of the relationship between the propensity to drop out and GED policies. The dropout measures used are state-level dropout and school continuation rates. The papers are similar in that each capitalizes on the fact that many GED policies differ across states and across time, making it easier and/or cheaper for someone to obtain a GED in some states and at some times than it is in other states or at other times. For example, in some states, dropouts cannot obtain a GED before the age of 18, but in other states, dropouts can acquire the credential when they are at least 16 years of age. The GED age policy in some states has also varied over time. The key assumption is that by controlling for state-level variables that may be correlated with both changes in GED policy and changes in state school-continuation rates, any remaining variation in the state school-continuation rate is a result of the GED becoming easier or cheaper to obtain.<sup>8</sup> Under a key assumption that the GED policy variables are unrelated to any remaining unobserved state-level variables that might independently influence state dropout rates, one can interpret the estimated coefficients on the policy variables as the effect of the GED policy on the high school continuation rate.

Chaplin finds that 6 of the 16 GED policies he examines are statistically related to the state high school continuation rate and operate in the anticipated direction (i.e., policies that make the GED easier to obtain are associated with lower school continuation rates, and those that make it harder are associated with higher continuation rates).<sup>9</sup> For example, in states where dropouts can obtain a GED without additional state restrictions (over and above national-level restrictions), the high school continuation rate is 1.5 percentage points lower. Other policies related to lower high school continuation rates are:

- allowing individuals to obtain a GED if they are incarcerated or under a court order;
- allowing individuals who would otherwise face certain restrictions to obtain a GED if their class has graduated;
- allowing otherwise ineligible individuals to obtain a GED if they have been out of school a specified number of months;

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<sup>8</sup>Chaplin defines the school continuation rate as the number of youth in a given state and grade divided by the number from the previous grade in the previous year in that state. These calculations are made using data from the Common Core of Data.

<sup>9</sup>Table 2 of Chaplin (1999).

- allowing otherwise ineligible individuals to obtain a GED if they have taken certain school courses prior to dropping out;
- allowing dropouts to bypass other restrictions if they can pass a GED practice test.

The effect sizes for the policy variables that are statistically significant range from a one percentage point decrease in continuation rates if underage dropouts are allowed to obtain a GED if their class has graduated to a 6 percentage point decrease if passing a practice test means other restrictions are waived.

Lillard (2001) takes a similar approach to the GED-dropout question, although Lillard uses the high school dropout rate in the state in a given year as the primary dependent variable.<sup>10</sup> The strongest result in this study is that increased out-of-pocket costs for taking the GED are associated with substantial and statistically significant decreases in the state dropout rate.<sup>11</sup> Based on the estimates, half a standard deviation increase in testing fees (about a \$3.45 increase) is associated with a decrease in the state dropout rate of about 1.8 percentage points or about a 9% decrease in the mean rate.

The three papers discussed here provide the first insights into how the GED testing program may be related to students' decision to drop out. From Agodini and Dynarski (2000), we should take away the following lesson: Although some students may choose to obtain a GED rather than a regular high school diploma, simply making the GED harder or, in the extreme, impossible to get would not necessarily be the correct policy response. They show that if there were no GED option, many students might choose to drop out without a credential rather than graduate from high school.

Meanwhile, Chaplin (1999) and Lillard (2001) find that certain GED policies are likely related to school dropout rates. The key assumption in both papers is that the variables in the regressions control for all state-level factors associated with both GED policy and the dropout rate.

Some relatively large estimated effect sizes in both the Chaplin and the Lillard papers suggest, however, that some caution is warranted. For example, Chaplin estimates that GED policies requiring the permission of parents before underage students can obtain a GED leads to an increase

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<sup>10</sup>Lillard defines the dropout rate for a given state in year  $t$  as the fraction of all 14-year-olds in that state who are enrolled in the 9th grade in year  $t-4$  minus the fraction of all 18-year-olds in that state who graduate in year  $t$ .

<sup>11</sup>Table A3 of Lillard (2001).

in the mean high school continuation rate of over 6% (6.5 percentage point increase). And Lillard estimates that increasing the GED testing fees by \$3.45 would decrease the mean dropout rate by 9% (1.8 percentage points). Both estimates represent substantial, and perhaps implausibly large, impacts on dropout rates.

The large effect sizes in these two papers may mean that some key variables are not accounted for and that the estimates are therefore biased upward. Nevertheless, in both papers, many GED policy variables are statistically related to the students' decision to drop out. Perhaps more important, however, is that these papers represent the first attempts to answer a critical question concerning the GED program: In an era when skills and education are more important than ever, what role, if any, does the GED play in encouraging students to leave school early?

***Lesson 2: There Are Economic Payoffs to a GED, but They Accrue Only to Dropouts Who Leave School With Low Skills.*** As previously discussed, the early GED literature consistently indicated only small and often statistically insignificant differences in the labor market outcomes of GED holders and uncredentialed dropouts, after accounting for years of completed school and cognitive skills. All of these earlier results were, however, based on two implicit assumptions: First, there were no unobservable factors correlated with both GED status and the outcome of interest. When this is not the case, standard estimation techniques yield biased results. One name for this problem is “selectivity bias.” Earlier work assumed there was no selectivity bias problem. Second, earlier research on the economic impact of the GED ignored the possibility that the effect of the credential on the labor market outcome of interest might be quite different for lower skilled dropouts than for higher skilled dropouts.

Nine studies since 1997 have examined the economic returns to a GED. One of these directly addressed the selectivity bias question (Tyler, Murnane, & Willett, 2000), three allowed for differential GED effects by skill level (Murnane, Willett, & Boudett, 1999; Murnane, Willett, & Tyler, 2000; Tyler, Murnane, & Willett, 2001), and three examined the relationship between the GED and the labor market outcomes of particularly low-skilled individuals (Clark & Jaeger, 2002; Heckman, Hsueh, & Rubinstein, 2000; Tyler, Murnane, & Willett, 2000). The primary lesson from these studies is that the GED seems to be an economically valuable credential for dropouts, but only for those who leave school with weak cognitive skills. There appear to be no payoffs to a GED for dropouts who leave school with higher skills. A second lesson is that any selectivity bias

associated with the GED is likely negative in nature. That is, among a pool of dropouts, those with low expected lifetime earnings appear to choose to obtain a GED.

Unless there is the unusual controlled, randomized experimental research design, it is extremely rare in social science research to obtain estimates that have a causal interpretation because of the selectivity bias problem. Tyler, Murnane, and Willett (2000) were the first to explicitly address selectivity bias in GED-related research. Their work relied on what is known as a “natural experiment.” So-called “natural experiments” take advantage of sharp policy changes or differences across states in key policies in an attempt to mimic what one would attain with a true controlled, randomized experiment—random assignment into a treatment group and a control group. To the extent that using natural experiments results in assignment to treatment and control groups that is as good as random, selectivity bias is much less of a problem.

Tyler et al. (2000) were able to exploit a natural experiment because until 1997 the passing standard required to obtain a GED varied across states. A simple example using Connecticut and New York (these states are used here for illustrative purposes only) explains their approach. In 1990, the GED passing standard was lower in Connecticut than in New York. Given data from these two states containing GED test scores, the researchers could find individuals with scores so high that they would be awarded the GED in either state and individuals with scores so low that they would not obtain a GED in either state. However, there is a slice of the data in which individuals who reside in Connecticut have scores that allow them to narrowly pass the GED standard, but individuals with the same score residing in New York would narrowly fail the GED exams because of that state’s higher GED standard. Tyler et al. argue that any differences in the earnings of the Connecticut and New York individuals who are on the GED passing margin and have the same GED scores should result solely because the groups differ in GED status and work in different state labor markets.<sup>12</sup> They applied this method nationally, controlling for the effects that working in different state labor markets would have on earnings. The resulting estimates of the GED’s impact on earnings are arguably free of selectivity bias. To study dropouts from around the nation, Tyler et al. used a data set constructed by the Social Security Administration in concert with the GEDTS and several state departments of education.

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<sup>12</sup>Tyler, Murnane, and Willett discuss and test other assumptions that are required for unbiased estimates in their design. For example, it must be the case that there are no state-by-skill interactions.

Estimates in the Tyler et al. (2000) work indicate that for White male and female dropouts, receipt of a GED resulted in earnings 5 years later that were 10% to 19% higher than they would have been otherwise.<sup>13</sup> These estimates are considerably larger than are any of the estimates in the earlier GED literature. Tyler et al. explained the differences by making the following observation. Their estimates were driven by GED holders who barely passed the GED exams, the GED holders with the lowest cognitive skill levels. In contrast, previous estimates were based on *all* GED holders in a given data set, and the estimating models had constrained the impact of the GED on earnings to be the same regardless of skill level. If the GED has a small or zero impact on the outcomes of relatively high skilled dropouts and a more substantial impact on the outcomes of lower skilled dropouts, then models that do not allow for this difference will “average together” the two effects. Estimates based on such models may find no overall statistically discernible GED effect. Models that allowed the impact of the GED to differ by skill group would uncover the larger effects for the lower skilled group and the small or zero effects for the higher skilled group.

Although the Tyler et al. (2000) results are consistent with a “differing GED effect by skill level” story, they lacked appropriate data for testing the proposition. Data including both low- and high-skilled dropouts who did and did not obtain a GED, along with a model that would allow differential impact of the GED by skill level, are required. The same research team conducted follow-up research with these types of data and research design (Murnane, Willett, & Tyler, 2000). The results in this paper support the proposition that dropouts who leave school with relatively low cognitive skills benefit substantially from the GED, whereas dropouts who leave school with higher skills receive little or no later economic benefit.

The data set used was the sophomore cohort of the High School and Beyond (HSB) survey, and cognitive skills were measured using scores on a math achievement test that all HSB sample members took in the 10th grade. Low-skilled dropouts were defined as those in the bottom quartile of the 10th grade math test score distribution, and higher skilled dropouts were those in the upper three quartiles of the distribution. The authors first reproduced earlier GED results by estimating specifications in which the

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<sup>13</sup>Table V of Tyler, Murnane, and Willett (2000). Tyler et al. find no statistically significant effect for GED holders who are not White. They state that the relatively large number of Black males who obtain a GED while in prison may explain this. To the extent that these individuals are still in prison when Social Security earnings are measured, their observed earnings will underestimate their true potential earnings in the labor market.

impact of the GED was constrained to be the same across skill levels. In these specifications, the effect of the GED on earnings was consistently small and statistically insignificant, matching results in the literature prior to the Tyler et al. (2000) paper. In models that removed this constraint, the GED's estimated impact on the log earnings of 27-year-old low-skilled males was about 36% when only controls for family background, region of the country, and tenth-grade math test score were used and 28% when controls for work experience were added. Both estimates are significant at the 0.05 level.<sup>14</sup> In none of the specifications could the authors reject the null hypothesis that the log earnings of higher skilled GED holders were the same as the log earnings of similarly high-skilled, uncredentialed dropouts.

Additional support for the hypothesis that the impact of the GED on outcomes depends on the skill level of the dropout came from two other studies. One study examined males using data from the National Longitudinal Survey of Youth (NLSY; Murnane, Willett, & Boudett, 1999), defining low-skilled male dropouts in the NLSY as those in the bottom three quarters of the Armed Forces Qualifying Test (AFQT) distribution.<sup>15</sup> Five years after obtaining a GED, low-skilled male GED holders in the NLSY were predicted to have wages that were 6% higher and earnings that were almost 10% higher than low-skilled, uncredentialed dropouts.<sup>16</sup> Again, there was no evidence that the wages or earnings of higher skilled GED holders differed from those of higher skilled uncredentialed dropouts.

A second paper used HSB data to explore whether the differential GED-impact hypothesis held for females (Tyler, Murnane, & Willett, 2001). The results were very similar to results for males using HSB data. At age 27, low-skilled female GED holders had annual earnings that were 25% higher than those of low-skilled female dropouts without a GED, and at the same age, there was no difference in the earnings of higher skilled female GED holders and those of higher skilled, uncredentialed dropouts.<sup>17</sup>

Heckman, Hsueh, and Rubinstein (2000) used NLSY data to examine the effect of the GED on the log hourly wages of low-skilled dropouts, defined as those dropouts in the second quartile of the AFQT distribu-

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<sup>14</sup>Table 6, Models 1 and 2, respectively, of Murnane, Willett, and Tyler (2000).

<sup>15</sup>The AFQT score is a weighted average of four subtests of the Armed Services Vocational Aptitude Battery (ASVAB) that was administered to 94% of the participants in the NLSY in 1980.

<sup>16</sup>Table 4, Model 1a and Table 5, Model 1a, respectively, of Murnane, Willett, and Boudett (1999).

<sup>17</sup>Table 8, Model 1 of Tyler, Murnane, and Willett (2001).



tion. Estimates from random effects models showed that low-skilled GED holders (males and females together) had hourly wages about 10% higher than those of uncredentialed dropouts. Estimates that controlled for time-invariant unobservable differences between dropouts with and without a GED produced results similar to Murnane, Willett, and Boudett (1999): The hourly wages of low-skilled GED holders were about 5% higher than those of low-skilled dropouts without a GED. The Murnane et al. results were statistically significant, whereas those of Heckman et al. were not, which may be partially explained by the smaller sample size in Heckman et al. (about 200) versus Murnane et al. (about 900). Another difference between the Heckman et al. study and the other studies discussed thus far is that all of the specifications used by Heckman et al. controlled for total work experience and annual hours worked. If acquisition of a GED leads to greater work experience and hours worked, then controlling for these factors would result in smaller estimated effects of the GED on wages because work experience and hours worked are themselves related to higher wages.

The Heckman et al. (2000) results do not actually address the central topic in the cited paper. Their primary interest in that paper is to compare the noncognitive skills of GED holders to those of uncredentialed dropouts. Examples of the noncognitive skills they examined are the ability to resist criminal or aberrant behavior, the ability to attend school regularly, and the ability to make healthy lifestyle choices. Heckman et al. find that uncredentialed dropouts have a more favorable distribution of factors related to noncognitive skills than GED holders. For example, compared to uncredentialed dropouts, higher percentages of White male GED holders in the NLSY had intentionally damaged property at some point, been involved in fights at school, shoplifted, been involved in some way with drugs, or ever been arrested or convicted of a crime.<sup>18</sup> Heckman et al. argue that because the GED tests cognitive skills, it “selects” dropouts who have relatively high cognitive skills but below-average noncognitive skills. Their study does not make it possible to ascertain whether the noncognitive skills of GED holders and uncredentialed dropouts vary by cognitive skill level, an important question given the bulk of the evidence on the value of the GED for low-skilled dropouts.

Another paper examines a different set of dropouts with potentially low skills: foreign-schooled immigrants who enter the United States without a high school diploma (Clark & Jaeger, 2002). The Clark and Jaeger study

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<sup>18</sup>Table 5a of Heckman, Hsueh, and Rubinstein (2000).

is an important contribution to the field because it is the first work to study a group that is becoming an important component of the GED program: low-educated immigrants. The research question examined in this study differs from the other research discussed in this section because it compares GED holders and regular high school graduates rather than GED holders and uncredentialed dropouts. Consistent with previous research on the GED, Clark and Jaeger find that among U.S. natives, those with a regular high school diploma have higher hourly wages than observationally similar GED holders (an 8%, statistically significant wage advantage for high school graduates).<sup>19</sup> Among the foreign-born and foreign-schooled, however, GED holders in the United States earn 8% to 10% *more* than foreign-born and foreign-schooled individuals who hold a regular high school diploma from their country of origin.

Clark and Jaeger (2002) explain that U.S. employers may know little about the value of a foreign high school diploma, and hence about the skills that foreign-schooled high school graduates possess. On the other hand, they know something about the skills of people who hold a U.S. GED credential.<sup>20</sup> As a result, U.S. employers may use the GED credential as a signal of known productivity traits within the pool of foreign-born and foreign-educated workers. Clark and Jaeger do not explore the possibility that foreign-born and foreign-schooled workers who obtain a GED may develop substantial human capital on the road to acquiring the credential, including time spent learning to read and write in English.

The consistent finding that low-skilled dropouts seem to benefit from a GED but higher skilled dropouts do not has two possible explanations. First, low-skilled dropouts, especially those who are young, tend to have very spotty work histories. Often, the job application, in which one's recent work history is exposed, is the first screen employers use for entry-level jobs. Given two individuals with weak applications, employers may use the GED as a signal that one individual has adjusted attitudes and behaviors in ways that will provide relatively more productivity. To the extent that higher skilled dropouts have better work histories and hence better applications, employers may rely less on the GED as a signal of potential productivity.

A second explanation for the differences in the returns to a GED by skill level comes from human capital theory. The human capital benefits of the

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<sup>19</sup>Table 5a of Clark and Jaeger (2002).

<sup>20</sup>This is consistent with other work looking at the returns to schooling when the schooling was obtained in another country. In particular see Schoeni (1997), Bratsberg and Ragan (1999), and Friedberg (2000).

GED may be small for dropouts who leave school with higher skills. These higher skilled individuals can pass the GED with little extra preparation, and as a result, they add relatively little to their store of human capital by taking the GED tests, compared to equally high-skilled dropouts who do not attempt the GED. However, for individuals with relatively low skills, there may be substantial skill building involved in positioning themselves to pass the GED exams. For these individuals, the human capital benefits of the credential at the margin could be substantial. Whether a human capital or a signaling story best explains the observed results depends largely on how well employers observe or learn about the skill levels of employees or prospective employees.

***Lesson 3: The Economic Payoffs to a GED Take Time to Accrue.*** In the previous section, the Tyler et al. (2000) estimates of the GED's impact on earnings were measured five years after receipt of the credential. Estimates described in the Murnane, Willett, and Boudett (1999) paper were also five years after the GED was obtained. In both cases, the emphasis on measuring outcomes some years after receipt of the GED is important because both studies find that the estimated impact of the GED tends to grow over time. Tyler et al. show that the GED earnings advantage grows during the first five years after receipt of the credential, and it is only by the fifth year that the earnings difference is statistically significant.

Three other post-1997 papers support the finding that it takes time for the GED to have a payoff in the labor market. Two of these papers (Boudett, 2000; Murnane, Willett, & Boudett, 1999) use the longitudinal nature of NLSY data to estimate the GED's effect on wage and earnings growth. The first paper shows that the linear rate of wage growth of low-skilled, male GED recipients increased by approximately 1.5% over the predicted rate of growth in the absence of the credential.<sup>21</sup> As a result, if the wages of low-skilled, male GED holders were compared to those of low-skilled, male uncredentialed dropouts one year after the receipt of the credential, only small and statistically insignificant differences would be observed. The wage difference after five years, however, is 6% and statistically significant.

Similarly, estimates in the Boudett (2000) paper show that the post-GED earnings of female dropouts grow at a faster rate than do the earnings of uncredentialed female dropouts. In the first year after receipt of a GED, female dropouts with the credential have mean earnings that are

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<sup>21</sup> Table 4, Model 1 of Murnane, Willett, and Boudett (1999).

only about \$300 greater than the mean earnings of uncredentialed female dropouts. After seven years, however, those with a GED have predicted earnings that are \$1,300 greater than females without a GED.<sup>22</sup>

Tyler (2001) uses GED data from Florida to provide further evidence on the timing of GED effects. His results are based on a longitudinal data set of male dropouts who attempted the GED in Florida between the years of 1994 and 1998, merged with quarterly earnings from the Florida unemployment insurance (UI) system. Quarterly earnings are available from the first quarter of 1993 through the last quarter of 1999. Tyler finds that GED holders earn under \$100 per quarter more than uncredentialed dropouts do for the first 10 quarters after they obtain their GED and that these differences are not statistically different from zero. Around the 11th or 12th quarter after the GED attempt, however, the earnings advantage for those with a GED begins to climb. About five years after the GED attempt, GED holders earn about \$400 more per quarter than uncredentialed dropouts. This 15% earnings advantage is close to the other estimates reviewed in this chapter, and it is especially close to the five-year Tyler et al. (2000) estimate based on different data and a different research design and estimation method.

***Lesson 4: Postsecondary Education and Training Are Fruitful But Little-Used Routes to Economic Success for GED Holders.*** GED-related research has found that among dropouts, acquisition of a GED led to a greater probability of obtaining postsecondary education or training provided by either the government or a proprietary school.<sup>23</sup> This raises the question of whether or not GED holders benefit from engaging in these activities and, if so, whether they obtain enough postsecondary education or training to have an impact on labor market outcomes.

NLSY-based evidence for males on both of these questions is available in Murnane, Willett, and Boudett (1999). They find that each year of college that a GED holder completes results in a 10.8% hourly wage differential.<sup>24</sup> These returns to postsecondary education are similar to the returns Kane and Rouse (1993) found for regular high school graduates. Thus, it appears that postsecondary education pays off as handsomely for GED holders as it does for regular high school graduates. However, Murnane et al. also find that only 12% of the GED holders in their data completed at least 1 year of college, and only 3% acquired at least an associate's

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<sup>22</sup> Table 3, Model 1 of Boudett (2000).

<sup>23</sup> See for example Murnane, Willett, and Boudett (1997).

<sup>24</sup> Table 4, Model 2b of Murnane, Willett, and Boudett (1999).

degree.<sup>25</sup> Thus, although using the GED to gain access to academically oriented postsecondary education is a good investment for dropouts, very few actually use the GED for this purpose.

Estimates from the same paper indicate that dropouts who received a year of on-the-job training had a 44% hourly wage differential.<sup>26</sup> As employers likely target the most productive workers for training investments, it is likely that this overstates the effect of the training itself on wages. Even so, only 18% of the male GED holders in the Murnane et al. (1999) study obtained *any* on-the-job training, and the median time spent in on-the-job training for those who had any training was only 63 hours.<sup>27</sup> Like postsecondary education, on-the-job training appears to be a valuable activity for GED holders but one in which few spend very much time.

A final lesson from this study is that the one type of human capital investment in which a large percentage of male GED recipients participated—off-the-job training—did not result in higher wages. Off-the-job training in the study is defined as government-sponsored training or training provided by a proprietary school. Forty-one percent of the GED holders obtained some off-the-job training, and the median amount of training time for those who obtained any was 569 hours. However, this type of vocational training had no measurable effect on their wages.<sup>28</sup>

Results in Murnane, Willett, and Tyler (2000) based on HSB data support these patterns. In that paper, the returns to an extra year of postsecondary education are the same for males with a regular high school diploma and male GED holders. Results also show, however, that 58% of the regular high school graduates in the HSB have more than one year of postsecondary education, but only 11% of the male GED holders in the HSB have more than one year of postsecondary education. Meanwhile, 19% of the GED holders have more than zero but less than one complete year of postsecondary education.<sup>29</sup> It is not clear whether the relatively large percentage of GED holders in this category results from attrition from multi-year programs or from participation in short-term vocational programs located in such academic settings as community colleges.

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<sup>25</sup> Table 2 of Murnane, Willett, and Boudett (1999).

<sup>26</sup> Table 4, Model 2b of Murnane, Willett, and Boudett (1999).

<sup>27</sup> Table 2 of Murnane, Willett, and Boudett (1999).

<sup>28</sup> Table 2 (for the sample statistics on percentages and hours associated with off-the-job training) and Table 4, Model 2b (for the estimated effect of off-the-job training on log wages) of Murnane, Willett, and Boudett (1999).

<sup>29</sup> Table 4 of Murnane, Willett, and Tyler (2000).

The relationship between GED acquisition and postsecondary education for females in the HSB is very similar to that reported here for males. Tyler, Murnane, and Willett (2001) find that the returns to postsecondary education are the same for regular high school graduates and for GED holders. However, only 18% of the female GED holders in HSB have more than one year of postsecondary education, and 16% have some, but less than a year, of postsecondary education.<sup>30</sup>

Boudett (2000) studied the effect that the GED has on the postsecondary education and training outcomes of females. Her findings for female dropouts, based on NLSY data, are similar to what was found for males. First, the returns to each year of postsecondary education are as high for GED holders as they are for regular high school graduates. However, as is the case with males, female GED holders obtain relatively little postsecondary education. Among women who are 24 years of age and have a GED, 11% have completed a year or more of postsecondary education but have no degree, and .5% have obtained at least an associate's degree. The figures for women aged 29 are similar, 20% and 3%.<sup>31</sup>

The second result in Boudett (2000) matches what was found for males concerning on-the-job training. Female dropouts who obtain on-the-job training have higher wages and earn more than those who do not, but most dropouts, including GED holders, accumulate very little on-the-job training.<sup>32</sup>

One departure in the Boudett study is that for females, off-the-job training appears to pay dividends. A year of off-the-job training is associated with earnings gains of \$1,239 in each subsequent year. These earnings gains are primarily the result of off-the-job training being associated with an increase in hours worked, rather than with hourly wage gains.<sup>33</sup> It is not clear why off-the-job training is associated with earnings gains for females but not for males. It could be that females engage in different forms of off-the-job training, particularly when that training is at a proprietary school. It is clear, however, that, as is the case with males, most of the training female GED holders receive is obtained off of the job. Forty-six percent of the female GED holders obtained some off-the-job training, and the median training time was 527 hours for those who received any training.<sup>34</sup>

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<sup>30</sup>Table 6 of Tyler, Murnane, and Willett (2001).

<sup>31</sup>Table 2 of Boudett (2000).

<sup>32</sup>Table 2 of Boudett (2000).

<sup>33</sup>Table 4 of Boudett (2000).

<sup>34</sup>Table 4 of Boudett (2000).

Berkthold, Geis, and Kaufman (1998) used data from the National Education Longitudinal Study of 1988 (NELS88) to study the postsecondary education and training patterns of dropouts. Their results complement what we have learned from studies based on NLSY and HSB data. Using NELS88 data provides the advantage of a more recent picture of what happens to dropouts in the years after their cohort graduates from high school. NELS88 is based on a nationally representative sample of students who were in the 8th grade in 1988 and graduated from high school in 1992, provided they had remained at their grade level. A disadvantage is that the latest available survey of the NELS88 national sample, conducted in 1994, provides only a two-year horizon after the cohort's expected year of high school graduation.

The Berkthold et al. (1998) study finds that of those in the NELS88 sample who obtained a regular high school diploma without ever dropping out, 78% had been in some kind of postsecondary education program by 1994. Meanwhile, only 40% of GED holders and 11% of the uncredentialed dropouts had any postsecondary education by this time. In terms of where individuals obtained their postsecondary education, 60% of the high school graduates were enrolled in or had completed a postsecondary degree-granting program, 9% were enrolled in or had completed a certificate-granting program, and 9% were in a program that did not lead to a certificate, license, associate's degree, or bachelor's degree. In the same categories, figures for GED holders were 20%, 15%, and 5%, and for uncredentialed dropouts, they were 1%, 7%, and 3%.<sup>35</sup> In a separate tabulation, Berkthold et al. find that 6.5% of the regular high school graduates in NELS88 had credits in vocational or technical courses at any school, and 57% had credits in academic courses at a 2- or 4-year college by 1994. Meanwhile, almost 10% of the GED holders earned credits in vocational or technical courses, and only 14% had credits in academic courses.<sup>36</sup>

Thus, two years after their cohort had graduated from high school, dropouts who had acquired a GED by this time had substantially less postsecondary education than regular high school graduates, and relatively more of their postsecondary education was vocational or technical training instead of academic courses leading to a degree. At the same time, GED holders are observed to have more favorable postsecondary education patterns than do uncredentialed dropouts.

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<sup>35</sup> All of these figures are based on Table 15 of Berkthold, Geis, and Kaufman (1998).

<sup>36</sup> These figures are based on Table 9a of Berkthold, Geis, and Kaufman (1998).

A recent report by the U.S. Census Bureau provides a longer horizon for the postsecondary and training experiences of GED holders. Using the longitudinal data in the Survey of Income and Program Participation (SIPP) data set, Bauman and Ryan (2001) report that 30% of the GED holders in that data set have some postsecondary education but no degree, and 8% have a bachelor's degree or higher. One explanation for the higher levels of postsecondary education in the SIPP data than in the estimates based on the HSB, NLSY, or NELS88 data sets could be that SIPP respondents were older when their postsecondary education levels were measured. The papers reviewed in this section using the HSB looked at individuals who were approximately 27 to 30 years of age in 1994, whereas the studies based on the NLSY used individuals who were 29 to 32 in 1994, and the NELS88 respondents were only about 20 years of age in 1994. In contrast, 46% of the SIPP sample that Bauman and Ryan studied were between the ages of 30 and 49, and 32% were 50 years of age or older. These differences suggest that a non-trivial portion of GED holders who obtain postsecondary degrees do so later in life.<sup>37</sup>

A smaller but more focused study examined GED holders at a 2-year public college. Hamilton (1998) identified 276 students with a GED credential who obtained their GED before the age of 21 and enrolled between fall 1991 and fall 1996. Transcript data indicated that 85% of the GED holders required remedial course work. On the other hand, the study found that the academic course completion ratio and the grade point average for GED holders were only slightly lower than for the average student at the college.

Complementing this work, another study analyzed 251 students at a small 4-year college who had a GED credential to determine how well GED test scores predict college grade point average (Rose, 1999). The unique feature of this study was the availability of both ACT (American College Test) and GED test scores for the sample of GED holders. The author found that, in a regression of grade point average on ACT scores and GED test scores, the ACT scores are reliable predictors of college grade point average but GED test scores are not. Unfortunately, this study does not give information regarding the correlation between ACT and GED scores or the correlations between each of these test scores and grade point average. These statistics would help in understanding how well each test, on its own, predicts grade point average, as well as the extent to which

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<sup>37</sup>This is not unexpected as a non-trivial portion of individuals obtain a GED later in life. For example, in 2001 about one third of the GED credentials awarded went to individuals 25 years of age or older.



multicollinearity between ACT and GED scores might be a problem in this analysis.

Ignoring for a moment whether these results can be generalized to a larger population, there are two implications in the results from these studies of GED holders in two small colleges. First, it appears that the GED test may not be a particularly effective measure of the skills required to succeed in postsecondary academic course work. This conclusion derives from the facts that (a) high percentages of dropouts who pass the GED need at least some remediation before engaging in postsecondary academic course work, and (b) the GED test is not predictive of college grade point average. However, the second implication, drawn largely from the Hamilton (1998) study, is somewhat more positive. That study suggests that given proper remedial work, GED holders perform college academic course work about on a par with the average college student.

The majority of dropouts who attempt the GED indicate that they do so to obtain further education. However, a review of the data indicates that these desires are rarely fulfilled. Although some GED holders engage in postsecondary education after receiving their credential, very few accumulate many credits, and even fewer obtain any type of postsecondary academic degree. These results hold important implications for the future economic success of GED holders in an economy that has increasingly turned against those lacking some postsecondary education.

## CONCLUSION

### Summary of the Lessons Learned

The GED credentialing program has evolved over the last half century from its small military-based roots to the quintessential “second chance” education program in the United States. This exam-based credential’s phenomenal growth in the 1960s and 1970s can be attributed to several factors, including demand produced by the baby boom demographic bulge, marketing campaigns by the GEDTS, extending the GED opportunity to such new populations as state and federal prisoners, the passage of the Adult Education Act and subsequent amendments, and the linkage of the GED to such postsecondary student loan and grant programs as the Stafford Loan and the Pell Grant. The effects on the GED program of more recent initiatives such as the National Institute for Literacy and Equipped for the Future, as well as the passage of the economically focused Workforce

Investment Act, can largely be seen in the development of the latest version of the GED exams. The overall message of the GED's history is that the program operates not in a vacuum but in a milieu in which state and federal mandates, organizations, and initiatives all exert pressures and generate expectations to which the GED program must respond.

Most of the education research has examined the economic benefits of the GED. The early research in this area established that GED holders are not the labor market equivalents of regular high school graduates. More recent research has turned to comparing GED holders and uncredentialed dropouts. This research tends to show that individuals who leave school with low skills typically benefit from obtaining a GED, but there are no statistical differences in the labor market outcomes of higher skilled GED holders and higher skilled uncredentialed dropouts.

The research consistently shows that GED holders have as high a return on postsecondary education as regular high school graduates. The same research also shows, however, that relatively few GED holders obtain enough postsecondary education to make a difference in their economic outcomes.

Meanwhile, new lines of research raise questions about whether the GED program induces students to drop out of high school who would otherwise graduate. This is a very difficult research topic, and more will have to be done in this area before we have convincing answers.

### **Implications for Policy**

Obtaining a GED has become a well-known and powerful goal in the world of adult education. Obtaining a GED represents a real step up for many adults, and in this sense, the GED program mirrors the K–12 education of a distant past, in which the end goal was to obtain a high school diploma. For quite some time now, efforts at the K–12 level have shifted to emphasizing a high school diploma as only the first step toward further education. In adult education, the rhetoric on this topic is stronger than the reality. Based on the low numbers of GED holders who obtain substantial amounts of postsecondary education, the GED remains the education capstone for the great majority of adult learners. This is partly a function of the clientele GED programs serve. Most adult learners have greater family and employment responsibilities and lower levels of available income than the typical 18-year-old high school graduate contemplating college. Nevertheless, a continued focus on the GED as the end goal of adult education will only leave adult learners further and further behind in a fast-changing economy.

A clear message from the available research is that GED programs should be much more tightly linked to additional education and training. This suggests, for example, that GED preparation programs that may make adult learners cognizant of and more comfortable with a postsecondary education environment may be more successful in moving learners into postsecondary education. Measurement of the GED preparation programs' effectiveness should include not only indicators for acquisition of a GED, but also indicators for the percentage of program participants who later enroll in postsecondary education. Adult learners can be tracked by linking adult education program data to postsecondary education data via Social Security numbers. Many states are already well positioned for this type of tracking, and the NRS provides additional impetus for more rigorous, robust, and inventive means of tracking adult learners. This tracking should be a goal of national and state adult education policy.

One lesson from the GED program is that there may be value in thinking about awarding certificates based on either exams or performance to adult learners below the level of GED preparation. If employers were to value a certificate demonstrating that an individual had successfully completed an ESOL or ABE course, additional certificates might serve as motivating "carrots" in ESOL or ABE courses and lead to higher program completion rates and more overall learning in these programs. The ascendance of the GED program suggests that it may be useful to create pilot certification programs at lower levels of adult education in selected communities.

### **Implications for Research**

Generating tighter linkages between GED programs and postsecondary education should be a policy goal. Equally important, however, is research that can help us understand the primary factors that depress GED holders' postsecondary enrollment patterns. Is the cause a lack of income for college or lack of information about available sources of postsecondary financial aid? Is it lack of affordable and acceptable day care or time constraints associated with employment? Is it transportation problems or simply fear and uncertainty because the college campus is an unknown environment? Until we know the answers to these questions, we can only guess which areas should be addressed first.

Research into whether the presence of the GED program tends to induce students to drop out of school also needs expansion. Economists and others have questioned the potential role of the GED in raising dropout rates, indicating a recognized need for more research. This is a particularly

difficult research question because it is hard to find a suitable comparison group that could provide information on the counterfactual question: What would a given group of GED candidates have done had there been no GED program? One potential way to study this question is through a closer look at so-called “in-school” GED programs. Certain states, such as Florida and Texas, allow some high schools to offer GED preparation programs to students who are determined to be at risk of dropping out of school. That some of these programs may come and go in the same school or that there may be similar schools where such programs do not exist suggests the possibility of being able to construct comparison groups that approximate the relevant counterfactual.

Finally, all of the GED research to date has been concerned with economic or postsecondary education outcomes. There are, however, other research questions that hold enormous importance for the individual and society. For example, do the children of GED holders have better schooling, health, and social outcomes because their parents earned a GED? Are GED holders themselves healthier because they have obtained this credential? Are they better, more stable parents, neighbors, and citizens? Do GED holders have lower crime-participation rates and higher levels of civic engagement than they would have had without this credential? Even if there were no economic benefits associated with obtaining a GED, research that provided positive answers to any of these questions could affirm the importance of America’s “second chance” credential.

### **Implications for Practice**

Several lessons from the research have implications for practice in GED preparation programs. First, because the largest economic payoff from obtaining a GED accrues to the least skilled, GED programs need to focus on helping these students succeed. To accomplish this, GED preparation programs should focus first on helping adult learners stay in a program. Research in other areas of adult education suggests that adult responsibilities and other barriers result in low completion rates for adult education programs (Comings, Cuban, Bos, & Taylor, 2001). Second, where it is not already happening, GED preparation programs need to refocus resources to help the least skilled develop human capital, even at the expense of overall GED pass rates in a given program. Such a refocusing of resources and energy may be increasingly hard, given the incentives put in place by the NRS requirements to show performance results. It is much easier for a GED program to measure success in the number of individuals who

acquired a GED than it is to show the amount of human capital accumulation resulting from the program. Nevertheless, research evidence indicating that a GED pays off for the least skilled but not for more highly skilled dropouts gives a clear directive that GED preparation programs need to focus resources on the skill development of lower skilled adult learners. On the other hand, it is likely that the higher skilled GED holders have the best chances of succeeding in postsecondary education, which leads to the second implication of this review for adult education practice.

The research consistently shows that relatively small percentages of GED holders obtain much postsecondary education, even though well over half of all GED candidates indicate that they are acquiring the credential to get further education (GED Testing Service, 2002). Thus, it seems that GED holders currently obtain less postsecondary education and/or training than would seem desirable from either the individual's or society's viewpoint. If this is indeed the case, then the message for GED preparation program practitioners—from curriculum designers to program administrators to teachers and counselors—is clear: It is critically important to help adult learners see the connection between additional education and training and their future economic success. There are adult education curriculum materials that explicitly make this link, including *Beyond the GED*, developed by the National Center for the Study of Adult Learning and Literacy (NCSALL; see Fass & Garner, 2000). In addition to a curricular response, there may be a need to educate some practitioners about the importance of seeing the GED as a steppingstone to further human capital development rather than as an end goal. There may also be a need to provide training so that teachers have effective strategies for conveying to adult learners the importance of postsecondary education and training in today's labor market.

There is a caveat to this call for change at the practitioner level, however: There is no need to refocus practice if, from society's point of view, GED holders are currently making the correct investment decisions about postsecondary education and training. That is, unpalatable as it seems from an equality standpoint, the few GED holders who currently get more education and/or training may be exactly the ones that society would want to engage in these activities. The reason may be that it is only for these individuals that the lifetime benefits from the extra human capital outweigh the costs to society of providing the additional education and/or training.<sup>38</sup> In this scenario, other individuals whom we might induce to obtain more

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<sup>38</sup>To be precise, the present discounted value of the marginal lifetime benefits from the education or training outweigh the present discounted value of the costs.

education or training would actually have lower economic returns to the additional education than we would have expected, based on the returns to postsecondary education that we observe for the current GED holders who go on to college.

There are, of course, reasons to believe that this ideal equilibrium is not being met. It may be, for example, that GED holders do not sufficiently invest in further education or training because they do not possess good information about the importance to their future of human capital development beyond GED acquisition, or they may lack the resources to finance further education or training. These are both forms of “market failure” that lead to incorrect investment decisions from society’s point of view.<sup>39</sup> Thus, there are roles that practitioners can (and in many cases already do) play in helping adult learners acquire the level of education and training that is right for them. Practitioners can help learners understand the importance of education beyond the GED. They can provide information about college and vocational training programs and the availability of financial aid.<sup>40</sup> They can help learners fill out the often-complicated admission and financial aid forms. And they can help their students think about the logistics of navigating college or training programs while adult responsibilities are waiting at home. In short, to the extent that there is room for improvement in using GED preparation programs to foster a culture of additional education, there is room to improve the lives of adult learners by using the GED credential as a steppingstone to further education.

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<sup>39</sup>In this case, the market being considered is the market for education, where individuals choose the amounts they “purchase.”

<sup>40</sup>Kane (1999) argues that individuals from low-income, low-education families are often unaware of the extent or availability of student financial aid for postsecondary education and training.

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