

ORIGINAL ARTICLE

Open Access

# Are employability skills learned in U.S. youth education and training programs?

Robert I Lerman<sup>1,2,3</sup>

Correspondence: [blerman@urban.org](mailto:blerman@urban.org)

<sup>1</sup>Urban Institute, 2100 M Street, NW,  
Washington DC 20027, USA

<sup>2</sup>American University, Washington  
DC, USA

Full list of author information is  
available at the end of the article

## Abstract

Skills are a central source of high productivity and economic well-being. But what do we mean by productive skills? Both with regard to measurement and policy, the primary focus in the U.S. has been on academic skills, as measured by tests of reading, writing and math abilities and by educational attainment, including degrees completed. However, a new consensus is emerging that an array of non-academic skills and occupational skills may be at least as important for labor market success. After reviewing the evidence on respective roles of various types of skills required by employers, this paper examines the skill-enhancing effects of several youth programs and demonstrations, with an emphasis on how well these efforts raise non-academic skills directly through purposeful activities or indirectly as a result of other employment-enhancing services.

**Keywords:** Skills, Youth, Training

**JEL codes:** I28, J08, J24

## Introduction

The weak outcomes of the U.S. education and training system have been a major source of concern for decades. In 1983, the famous “A Nation at Risk” report cited declines and low levels in student achievement relative to other countries in terms of math and verbal tests, functional illiteracy, weak high order skills, and the need for remedial math courses in public colleges, businesses, and the military (National Commission on Excellence in Education 1983). Today, commentators, researchers, and policymakers continue to decry the state of American education. In a 2009 column, Thomas Friedman approvingly quotes a former business executive, who argues, “Our education failure is the largest contributing factor to the decline of the American worker’s global competitiveness, particularly at the middle and bottom ranges.”

Economists have generated a body of evidence showing that cognitive skills are increasingly important in achieving high earnings. The sharp rise in the wages of college graduates relative to high school graduates indicates that employers will pay an increasingly high premium to employ workers with higher level academic skills. The need for a nontrivial level of cognitive skills extends to at-risk groups of workers, including high school dropouts. Evidence shows higher math scores are positively correlated with higher earnings (Tyler 2004). The relative earnings gains for women are linked in significant ways to occupational shifts that involve rising demand for cognitive skills (Bacolod and Blum 2010).

While cognitive skills in reading and math up to some level are generally prerequisites for good jobs, a growing body of evidence suggests that non-academic skills are at least as powerful determinants of earnings. Until recently, information on the non-academic skills of a large sample of workers was not readily available and was certainly less common than data on educational attainment and tests of academic skills. Often, non-academic skills were considered as part of a residual impact not captured by school attainment or measured test scores. However, new data sources and innovative techniques have begun to shed light on the importance of non-academic skills, especially for at-risk youth.

Non-academic skills cover a wide scope. As Borghans et al. (2008) and Almlund et al. (2011) have argued, the term “non-cognitive skills” is not appropriate for summarizing personality and other non-academic skills since cognitive skills influence and are influenced by aspects of personality; they point out that “...few aspects of behavior are devoid of cognition.” Easy distinctions elude academic and non-academic skills as well. Certainly, math, reading, and writing abilities are relevant to learning a range of occupational skills. On the other hand, remaining drug-free, honesty, and punctuality are behaviors that are not necessarily linked with cognitive skills. Still other, hard to measure skills, such as creativity and problem-solving, likely depend on cognitive abilities.

Unfortunately, at-risk young men have experienced stagnating educational attainment, weak and stagnant wages, high unemployment, incarceration, unwed fatherhood, and family instability. Yet, despite rising levels of per pupil spending on elementary and secondary schools, the educational and more importantly the job outcomes for low-income and minority students (especially males) are disappointing and show little progress. The nation’s publicly sponsored job training programs, targeted mainly at the disadvantaged, have fared little better. For example, an experimental evaluation of the Job Training Partnership Act found no impacts of earnings gains from participation (Orr et al. 1996). A major emphasis on youth programs in the late 1970s yielded at best mixed results (Hahn and Lerman 1985).

Why have so many initiatives in education, work experience and training led to uneven or poor outcomes for young people? One possibility is the difficulty of teaching academic skills. Another possibility is that the initiatives either do not emphasize or successfully teach employability and occupational skills, which may especially important to a young person’s success. Many programs funded as job training spend considerable time preparing participants for an alternative high school credential (the GED test) despite evidence that the earnings gains from passing the GED test are weak (Heckman and LaFontaine 2006).<sup>1</sup>

Possibly, developing effective employability skills requires learning in the context of actual workplaces. The widespread evidence of gains to work experience in the human capital literature may reflect the improvement of such non-academic skills as listening, working effectively in teams, maintaining work discipline, and reliability. Thus, even employment and training programs that do not explicitly target non-academic skills may help young people improve then by raising their chance of finding and staying on an initial job.

This paper considers two central questions about skills and earnings. The first asks: what are the relevant skills for success in the labor market, especially for at-risk workers and those holding middle skills jobs? The next section describes non-academic

and occupational skills and their importance for success in the job market. The second question is: what interventions have increased non-academic skills and/or occupational skills and helped participants do better in the job market? The review deals with programs aimed at non-academic, employability and occupational skills as well as programs affecting non-academic skills as a byproduct of other activities. Then, the paper discusses potential barriers to upgrading non-academic skills, especially barriers within the school system. I conclude by highlighting the need for more research and measurement on methods to raise non-academic skills, specifically by analyzing the role of dual learning and earning models that combine work with schooling in an integrated manner.

### **What mix of skills is critical for success in the labor market?**

For employers, the key question is what combination of academic skills, non-academic skills, behaviors, and personality traits yields the best job performance or at least performance at acceptable levels? Researchers have examined this question by asking employers, asking workers, and determining which skills are most rewarded based on estimates linking wage rates and particular skills.<sup>2</sup> Recent studies have analyzed the earnings gains conveyed by non-academic skills, including personality variables, and the interactions between cognitive and non-cognitive skills (Heckman et al. 2006; Almlund et al. 2011).

The diversity of occupations and sub-occupations makes it difficult to generalize. While few skills may be required for the lowest wage jobs, the idea of “necessary skills” for the workplace usually translates into what people need for “good” jobs. Human capital models view skills as generated through formal education and work experience. The skills may be *specific* in that they raise a worker’s productivity only within one firm, *general* in that the worker’s added capabilities can increase productivity in a range of firms, or a combination of both (learning one firm’s computer system can help in another firm). In principle, general skills can encompass non-academic and occupational skills, but much of the empirical work on human capital has measured general skills in terms of educational attainment, years of work experience, and sometimes performance on standardized math and reading tests.

The widening gap between the earnings of college and high school graduates provides a *prima facie* case for viewing skills through the lens of educational attainment. While the capabilities learned in college are rewarded in the workplace, they are far from the only skills that generate value and improve employment and wage outcomes. For policy purposes, it is important to specify which academic skills are required for nearly all occupations as well as which other, non-academic skills are central to success in the job market. Understanding the broad range of skills may lead to widening the range of tools used to promote increases in earnings.

About 15 years ago, Murnane and Levy (1996) described the academic skills they believe students must master to gain access to middle class jobs. Rather than calling for the upper level math, science and English as graduation requirements, as recommended under the current Common Standards State Standards project, Murnane and Levy argued for achieving the more modest objectives of insuring that students gain the ability to read at least at the ninth-grade level, the ability to do math at least at the ninth grade level, and the ability to solve semi-structured problems where hypotheses must

be formed and tested. Drawing on case studies of firms hiring front-line workers, they also argued for the importance of selected non-academic skills, particularly the ability to work in groups with persons of various backgrounds, a basic ability to communicate with supervisors and other workers, and the ability to use personal computers to carry out simple tasks.

Another effort to determine what skills workers need to succeed in their respective jobs and careers was undertaken in 1991 by the Secretary's Commission on Achieving Necessary Skills (SCANS). The Commission researched the literature, consulted with experts, and conducted detailed interviews with workers and/or supervisors in 50 occupations. The interviews rated the importance of various skills in the context of illustrative tasks and tools on the job as well as critical incidents. Using these sources, the Commission (1992) categorized necessary skills into basic skills, thinking skills, personal qualities and a set of workplace competencies. In addition to reading, writing, and math skills, basic skills include listening and speaking. The thinking skills cover creative thinking, decision-making, problem solving, reasoning, and an ability to learn. The Commission specifies that personal qualities include responsibility, self-esteem, being sociable, self-management, and integrity and honesty. It identifies five groups of workplace competencies, including the ability to allocate resources (time, money, and facilities), interpersonal skills (such as teamwork, teaching others, and leadership), the ability to acquire and use information, understands systems, and works well with technology.

A number of countries have developed classifications of employment-related generic skills, including Australia, New Zealand, the United Kingdom, France, and the Netherlands (Smith and Comyn 2003). Denmark and Germany integrate generic competencies into occupational qualifications. The lists of skills are similar; for example, Australia's key competencies include collecting and analyzing information, communicating ideas and information, planning and organizing activities, working with others in teams, using mathematical ideas and techniques, solving problems, and using technology.

Employer surveys reinforce the importance of skills that go well beyond academic skills. In a mid-1990s survey of 3,200 employers in four large metropolitan areas, employers reported that such personal qualities as responsibility, integrity and self-management are as important as or more important than basic skills (Holzer 1997). In another employer survey undertaken in the mid-1990s of 3,300 businesses (the National Employer Survey), employers ranked attitude, communication skills, previous work experience, employer recommendations, and industry-based credentials above years of schooling, grades, and test scores administered as part of the interview (Zemsky 1997). Non-academic skills are especially critical for entry level and hourly workers. Of employers drawn from a national sample in the U.S. in 1996, 69 percent reported rejecting hourly applicants because they lacked basic employability skills, such as showing up every day, showing up on time, and having a strong work ethic. This reason for rejecting applicants was more than double the likelihood of rejecting applicants because of inadequate reading and writing skills. Rejections for not passing a drug test were almost as common as for a lack of literacy skills (Barton 2006). In a 2007 survey of employers in Washington State, about 60 percent of employers reported difficulty in hiring (Washington Workforce Training Board 2008). They experienced less difficulty finding workers with adequate reading, writing, and math skills than with appropriate occupational, problem-solving, teamwork, communication, and adaptability skills as well positive work habits and a willingness to accept supervision.

This pattern of responses about skills is not unique to the U.S. In the United Kingdom, a 1998 survey of 4,000 employers found that the four skills most lacking in 16-24 year-olds were technical and practical skills, general communication skills, customer handling skills, and teamwork skills (Westwood 2004). At the bottom of the list were numeracy and literacy skills. In a 2002 survey of 27,000 employers in the UK, 23 percent of employers reported a significant number of their staff were less than fully proficient in their jobs. Skill shortfalls were most common in communication, teamwork, other technical and practical skills, customer handling, and problem solving and least common in numeracy and literacy (Hillage et al. 2002).

Other evidence indicating the importance of non-academic skills comes from the 2003 National Assessment of Adult Literacy (NAAL). The NAAL data show that GED recipients have test scores on prose, document, and quantitative literacy that are nearly identical to the test scores of adults with a high school diploma and far above the scores of high school dropouts (Kutner et al 2007). Yet, those holding a GED certificate have earnings levels closer to high school dropouts than to workers with a high school diploma (Heckman and LaFontaine 2006). Other evidence shows that GED recipients have non-cognitive traits that are similar to those of dropouts (Heckman and Rubinstein 2001). The evidence indicates that non-academic skills play a larger role in determining wages than academic skills at many jobs.<sup>3</sup>

Evidence confirming the importance of non-cognitive/non-academic skills has been accumulating in other literature as well.<sup>4</sup> In reviewing 25 studies from the 1950s through the late 1990s, Bowles and Gintis (2002) conclude that even the returns to schooling are strongly affected by the non-cognitive component and that there is little indication that the cognitive component has increased in importance over time. Heckman et al. (2006) find that, except for college graduates, non-cognitive skills (as measured by indices of locus of control and self-esteem) exert at least as high and probably higher impact on job market outcomes than do cognitive skills (word knowledge, paragraph comprehension, arithmetic reasoning, mathematical knowledge, and coding speed as measured by the Armed Forces Vocational Aptitude Battery). Using another data source (the National Education Longitudinal Study (NLS)), Deke and Haimson (2006) produce results that reinforce the importance of nonacademic competencies, such as work habits, leadership skills, teamwork and other sports-related skills, and attitudes toward whether luck or effort determine success in life.

An elaborate effort to distinguish the importance of cognitive skills from personality traits that involve a variety of non-academic skills was undertaken by Borghans, et al. (2008). They find an important role for several personality variables in influencing schooling, wages, crime, teenage pregnancy and longevity (Almlund et al. 2011). In one study by Heckman et al. (2011), the effects of personality variables on earnings occur through their effect on schooling.

Another recent study (Lindqvist and Vestman 2011) documents the differential impacts of cognitive and non-cognitive skills on the earnings of Swedish men. The authors use data from a representative sample of the Swedish male population matched with education, earnings, and information on cognitive and non-cognitive skills obtained in the military enlistment process through interviews with psychologists. Persistence, social skills and emotional stability are the key non-cognitive skills measured and coded from the interview. Lindqvist and Vestman find that cognitive and non-cognitive skills are both

positively related to employment and earnings. As found in other studies, personality traits are valued at all levels of job complexity (Almlund et al. 2011). In the low to mid ranges of cognitive skills, extra non-cognitive skills exert a higher impact on wages than do extra cognitive skills. Only at high ranges of cognitive skills do further increases generate a far more positive impact on wages than do non-cognitive skills.

In general, the use and value of some non-academic, employability skills are contextual, in that they are learned best and applied in specific occupations. Responsibility and emotional stability are less important for an artist than for a worker monitoring a nuclear power plant. The principle of comparative advantage applies; people choose occupations that most reward their combination of skills. As Cattan (2011) documents, the impacts of cognitive and non-cognitive skills on wages vary across occupations, with non-cognitive skills showing special importance for managers and cognitive skills yielding the highest gains for professional fields.

Non-academic skills are often developed and used as part of a “community of practice” (Stasz 2001). Nelsen (1997) points out that workplaces not only require formal knowledge—facts, principles, theories, math and writing skills—but also informal knowledge—embodied in heuristics, work styles, and contextualized understanding of tools and techniques. Her revealing case study of auto repair workers shows the importance of social skills of new workers for learning the informal knowledge of experienced workers, as captured in stories, advice, and guided practice. The social skills learned at school are not usually the same or most useful ones for work.

Although many schools attempt to build some non-academic skills, measures of school performance primarily focus on increasing academic skills and not on enhancing other important skills. In contrast, operators of job training programs have long emphasized the need for workers, especially disadvantaged men, to gain self-esteem, communicate effectively, envision long-term goals, and demonstrate personal responsibility as well as to avoid inflexibility, dishonesty, defensiveness, and impatience (Carmona 2007). Program operators often must help disadvantaged men overcome their fears of rejection so that they are at least willing to apply for jobs (Shipler 2004).

### **What interventions can improve non-academic skills?**

Training programs address non-academic skills at the start, by requiring participants to show up to sessions on time, to dress properly, to recognize strengths and limitation, to interact appropriately with the leader and others in the program, and to communicate by looking directly at other people. The key questions are: can non-academic skills be taught? If so, can program-induced changes in these skills yield gains in the job market? In most cases, non-academic skill development is often a byproduct of activities aimed at achieving other goals, including rigorous discipline within schools to improve educational outcomes, training to improve occupational skills, and sports teams that require discipline, practice, and teamwork.

### **A well-developed program for at-risk, out-of-school youth**

One intensive initiative that clearly emphasizes non-academic skills is the National Guard Youth ChalleNGe (or ChalleNGe). This program, which operates in 27 states, has provided training for over 90,000 young people since the early 1990s. Participants

are 16-18 upon entering the program and have dropped out or expelled from high school and are unemployed, but are drug-free and not heavily involved with the criminal justice system. The program begins with a two-week, Pre-ChalleNGe component in which youth face a demanding physical and psychological assessment, along with exposure to the program's rules, the program's military discipline, teamwork, and physical fitness. Only those who successfully complete this phase are formally enrolled in ChalleNGe and immediately enter a 22 week residential component. In this phase of the program, the emphasis is on promoting positive youth development through Leadership/Fellowship, Responsible Citizenship, Service to the Community, Life-Coping skills, Physical Fitness, Health and Hygiene, Job Skills, and Academic Excellence. Note that all but one are non-academic skills (Millenky et al. 2010). The learning activities for a GED or high school diploma take place in the context of a "quasi-military" environment. The subsequent, one-year phase of ChalleNGe includes follow-up services and mentoring, which begins during the residential component.

The Manpower Demonstration Research Corporation (MDRC) conducted an experimental evaluation of the ChalleNGe program, with current results covering a period three years after assignment to treatment or control status (Millenky et al. 2011). Clearly, applicants are a highly at-risk group. At application, nearly half had mostly D's and F's as grades, 44 percent had not completed 10<sup>th</sup> grade, over 80 percent had been suspended from school, and nearly one-third had been arrested. Most chose to apply for ChalleNGe in order to get their life back on track (77 percent) or to obtain a high school diploma or GED certificate (81 percent). Only 31 percent applied in order to join the military.

The evaluation compared all control applicants to all experimental applicants, whether they entered, enrolled or completed ChalleNGe. Of the applicants assigned to experimental status, 83 percent registered for the pre-ChalleNGe activity, 68 percent actually enrolled and entered the 22 month residential component, and 53 percent completed the program. Nearly 80 percent of enrollees completed the residential component of the program. The evaluators report impacts on the entire applicant pool, including the 17 percent that did not take up the first two weeks of the program. If the program had little effect on nonparticipants, the impact estimates will understate the actual effects on the "treated" enrollees.

The ChalleNGe intervention significantly raised the proportion of the treatment group earning a GED certificate to 57 percent, compared to 35 percent for controls. Given the evidence showing the GED certificate does little to improve job market outcomes, the induced GED certificates may not represent substantive gains for participants. About 30 percent of the treatment group earned a high school diploma, compared to about 27 percent of the control group, but the difference was not statistically significant. The intervention showed statistically significant gains in attaining some college credit and receiving vocational training. However, no differences emerged in the proportion attaining a trade license or certification.

The evaluators looked at life-coping and leadership skills with surveys, but they lacked direct information on actual life-coping and leadership. Results reveal statistically significant, but quite modest improvements in learning how to organize time, how to control one's temper, the challenges of being a leader, presenting ideas without criticizing others, and encouraging different points of view. If improvements in attitudes materialized, one would expect less anti-social and self-harming behaviors. Unfortunately,

the data on arrests, convictions, delinquency, and excessive use of alcohol show no evidence of improved outcomes.

The ChalleNGe program generated significant gains in jobs and earnings. At three years after assignment (2008-2009), when unemployment was high and rising, 57 percent of the treatment group but only 50 percent of controls were holding an unsubsidized job. Current weekly earnings for ChalleNGe participants (\$240) averaged about 8 percent more than for the control group (\$210). Over the prior year, the treatment group worked about 1 month longer (8.1 vs. 7.2) and earned about \$2,250 more than controls (\$13,500 vs. \$11,250). Idleness among youth, defined as not participating in school or work in the last three months, declined as a result of the program, from 36% among controls to 26% among experimentals. A small group of 20 year-olds interviewed in depth reported that the program raised their sense of self-control, leadership, and coping skills. But even this group faced serious limitations in finding a well-paid, career-oriented job (Millenky et al. 2011).

The ChalleNGe Academy pays a good deal of attention to non-academic skills but the evaluation finds only modest positive impacts on measures of these skills along with big increases in GED completion and healthy increases in earnings. It is possible that non-academic skills did improve in the context of job search and jobs. Alternatively, the improved earnings may have resulted from improved academic skills and the disciplined effort to achieve them.

### **Job corps**

The largest residential training program in the U.S. for at-risk youth is the Job Corps. It has operated continuously since the mid-1960s. The program funds about 60,000 places for youth to spend one year in training and remedial education, though the average Corps member spends only about 6 months in the program. Since most Job Corps participants go to residential centers, the program offers a great opportunity to upgrade academic, non-academic, and vocational skills all at once. Increasing the share of youth with at least a GED certificate and with an occupational credential have been important in-program goals, but the program's ultimate goal is to raise the earnings of participating disadvantaged youth.

While the program offers counseling and training in social skills, the MPR process analysis highlighted problems along these dimensions that were evident at the time of the evaluation (Johnson et al 1999). Counseling caseloads were very high and the social skills training classes were delivered by Residential Advisors with little training in the field. As a result, while the staff viewed the social skills training as quite important, they saw a need for improvement. Unfortunately, the experimental analysis did not attempt to measure any improvements in these critical non-academic skills induced by Job Corps.

Job Corps succeeded in increasing the share of youth who attained a GED certificate or earned a vocational certificate. Improvements in these outcomes may have translated into short-term increases in earnings, but the gains faded over time. An early study found the opportunity to participate in Job Corps raised youth earnings in unsubsidized jobs by 12 percent in the fourth year after application. However, subsequent evidence documented a rapid erosion of Job Corps earnings gains after the four-year follow-up and a likely overstatement of earlier earnings gains because of differential attrition. Earnings gains from Job Corps eroded completely soon after the 48 month follow-up (Schochet et al. 2006 and Schochet et al. 2008).



Men in their 20s fared far better than other groups. They sustained earnings gains of about \$1,500 per year (1995 dollars) through the period six to 10 years after entering the program. Some groups did worse by participating; those with a serious arrest record before entering Job Corps suffered significant earnings shortfalls by 2000–01 relative to their counterparts in the control group. Finally, Job Corps' intensive job training program still left about 40% without jobs, modest average earnings, relatively high rates of incarceration, and high rates of nonmarital fertility (40 percent of females). Overall, the evaluators project social costs at \$10,000 (in 1995 prices) more per participant than the social benefits. Given the high costs of the program (over \$16,000 in the mid-1990s), the results are disappointing.

### **Intensive learning communities within high schools**

One recent initiative that led to modest gains is the Talent Development High School model (Kemple et al. 2005). The evaluation of Talent Development focuses on overcoming student anonymity, low student expectations poor academic preparation, and weak family and community support. The Talent Development model reorganizes schools into small learning communities, emphasizes high academic standards with interesting content, and provides help for students needing assistance, added professional development, enhanced parent and community engagement, and work-based learning.

In ninth grade, students enter the Ninth Grade Success Academy, a self-contained school-within-a school where teachers form interdisciplinary units to improve how well students make the transition to high school. The Academies use a restricted physical setting, break the class into small groups, provide individualized support to encourage high attendance, employ block scheduling to help in the learning process and provide a specialized program for ninth graders struggling academically. After ninth grade, students enter a career academy of the type described above.

Evaluators estimated the impacts by comparing how outcomes changed within Talent Development schools (before and after implementation) with how outcomes changed in traditional schools. The impacts varied by cohort. In general, the model raised attendance, completion of high level courses, the number of credits earned, and promotion to 10<sup>th</sup> and 11<sup>th</sup> grade. The share of students earning at least two credits in math and English jumped by 10-16 percentage points compared to baseline rates of about 38 percent; promotion to 11<sup>th</sup> grade increased from 47.2 to 53.7 percent of students. Only the first two cohorts were tracked long enough to determine effects on high school graduation rates. For this group, high school graduation rates increased by about 7 percentage points, although the impact was statistically significant only for the first cohort. Gains in test scores were uneven, but did materialize for some cohorts. While improving learning behaviors and discipline of students is a goal of the Talent Development model, the evaluators did not directly measure employability skills, such as motivation, communication, and an ability to work with others. However, one indication that the program improved non-academic skills is the positive impact on school attendance.

### **Closer links with the job market using career academies**

Career Academies are high schools organized around an occupational or industry focus, such as health care, finance, and tourism. They operate within regular high schools and try to weave related occupational or industrial themes into a college preparatory curriculum,

enabling students to see relationships between academic subjects and their application to the school's focal area. Of the more than 1,600 academies, 22% are in finance, 14% in information technology, 12% in hospitality and tourism, 8% in health, and 8% in arts and communication. Other sectors include agriculture, transportation, manufacturing, and public service. Career academies are typically made up of 50–75 students per grade from the 10th through 12th grades. These students take two to four classes a year in the Academy taught by a common team of teachers, and at least one course is career-focused or occupation-focused. Students take other courses in the regular high school. The small learning communities help academies foster a sense of community, personal attention from teachers, and constructive collaboration with peers.

Academies attempt to use applied learning in academic courses as well as career-focused courses. Usually, career academies form partnerships with employers and local colleges, who often contribute money, material resources, speakers, and internships to improve student motivation and achievement. Compared to other high school students, Career Academy students are exposed to a wider range of experiences linked to careers, including job shadowing, internships, career fairs, and instructions on how to look for a job, prepare a resume, and take an interview. Work-based learning varies but the internships that many students experience are related to Academy's industry or occupation theme.

The evaluation covered students applying for career academies between 1993 and 1996. It estimated the impacts on labor force outcomes, educational attainment, and social adjustment of students (Kemple and Willner 2008). Participating academies were in business and finance, high-technology areas such as electronics and aerospace technology, health occupations, public service, travel and tourism, and video technology.

While the experiment yields reliable estimates of the impacts of access to career academies among those who apply, the applicant pool was apparently a more motivated group than is representative of the student population in these communities. The graduation rates of the control group were over 73%, well above the 65% graduation rate of a national sample of students from public, nonselective schools. Still, most applicants were at a high risk of dropping out. The estimated impacts cover those with and without access to academies, including the 15% assigned to academies who never enrolled and 30% who enrolled but left the academy before graduation.

The Career Academies used mentoring, career awareness, and linking student jobs with schooling far more than standard programs (Kemple et al. 1999). Each Career Academy developed formal work-based learning programs, including job opportunities provided by employer sponsors. As a result, students assigned to Career Academies were more likely to hold any job and were far more likely to hold jobs incorporating work-based learning than other students. The gap was especially wide in academies that had well-structured employer partnerships. In those programs, 40 percent of students had a work-based learning experience, as compared to 27 percent of the control group.

For the full pool of applicants, Career Academies induced striking gains in earnings, especially among minority young men (Kemple and Willner 2008). In the period between four and eight years after applying for the academies, young men in the treatment group were earning 17% more than those in the control group. This represents an increase in earnings of about \$3,700 per year. Young women did not experience any statistically significant gains in earnings. The percentage gains in earnings were highest for the students facing the highest risk of dropping out of school. Some longevity of

earnings gains is indicated by the significantly higher likelihood of promotion among the treatment group (in all risk groups) than among controls. About 39% of the career academy group reported their job is or was directly related to their high school program, a rate significantly higher than the 31% figure for controls. High school experiences influenced the current occupational choices of 46% of the Academy group compared with 36% of the controls. Given that only 55 percent of the treatment group actually took full advantage of the career academy, the earnings gains probably understate the actual impact of full participation.

The earning gains for experimentals came despite the absence of statistically significant improvements in the rate of completing a high school diploma, combined GED test/high school completion, or college completion. The control and experimental groups completed a high school diploma at unusually high rates for minority populations in urban school systems. Both groups had similar rates of completing vocational certificates, Associates' degrees, and BA degrees. Using an innovative statistical analysis of data from the demonstration, Page (Page 2011) concludes that most of the positive earnings impact from Career Academies resulted from substantially enhanced exposure to the "world of work", including work-based learning in school-linked internships. Thus, the Career Academies indicate that robust internships and incorporating a career focus into a high school program can raise earnings in the early years after high school without reducing college completion. The percentage gains in earnings for young men are as much as two to three years of added years of education.

Improvements in non-academic skills probably contributed to earnings gains. The earnings gains took place in the absence of improved academic test scores or significant impacts on years of schooling. The gains were concentrated on young minority men, a group that is especially limited in non-academic skills. Further, the Career Academies include activities that should improve non-academic skills; for example, having students learn together as a cohort and sharing mutual interests in an occupational or industry field improves their ability to work in a team. The added motivation to do well in an internship may teach students the importance of conscientiousness and sufficient occupation-related skills in the field they pursue to increase their marketability.

#### **Other career-focused programs**

Career-focused programs offer the prospect of enhanced student engagement for those who voluntarily enter such programs. They often involve work experiences that lead to more interaction with adults, more chances to feel productive, and an increased perception of the relevance of some academic courses. There is extensive non-experimental research on these issues, but no close quantitative link between the development of generic (non-occupational), non-academic skills and earnings. Still, many studies suggest the potential for upgrading occupational and other non-academic skills in ways that enhance earnings.

One study looks at the role of high school Career and Technical Education (CTE) programs on earnings, taking account of employer involvement in providing students with job shadowing opportunities, part-time paid and unpaid jobs, and mentoring (Bishop and Mane 2003). Holding constant for various individual, community, and school characteristics, the study found positive impacts of employer-school partnerships on 1994 labor

market outcomes at two years past expected high school graduation. The more active the employer-school partnership, the more young people earned, held jobs at higher rates, and avoided unemployment. Even students with low grades did better in the labor market as a result of these partnerships. Having more mentoring and work experience may have increased non-academic, employability and occupational skills; more access to jobs relevant to careers might have increased the motivation of students and their knowledge about job openings. Again, the job market gains did not come at the expense of schooling.

Career-related interventions in high schools were encouraged under the 1994 School-to-Work Opportunities Act (STWOA). One goal was to improve the links between work and learning, thereby promoting work-based learning and avoiding the negative effects of work experience on academic performance found in some studies. While STWOA was not evaluated by a randomized experiment, researchers used non-experimental methods to examine how learning in a structured work context could improve non-academic, employability skills or reduce student alienation from pure classroom-based education. One study of the early experience of minority high school students (Rivera-Batiz 2003) estimates that participation in a STW activity increased course work in math and science in high schools along with hours worked and reduced the likelihood of dropping out of high school. Another study found that such STW components as job shadowing, mentoring, cooperative education, and internships boosted participation in postsecondary education (Neumark and Rothstein 2007). Estimates showed that STW activities significantly reduced the proportion of young men who are idle (neither working nor in school). Among the half of the school population less likely to attend college, mentoring and cooperative education increased postsecondary education, while cooperative education, school enterprises, and internship or apprenticeship increased employment and lowered the share of youth who are idle after high school.

How can internships affect youth in school and careers? Bailey et al. (2004) conducted detailed observations studies of 25 internships lasting at least three months and linked to high school and community college programs. They examined the experiences of 25 interns, focusing on reinforcement of academic skills, work-based skills and career exploration, youth development and engagement, and the stimulus to new modes of thought. Although the internships did not appear to raise academic skills, many helped students learn about potential careers, gain problem-solving and teamwork skills, develop a sense of responsibility and accomplishment, and engage in new modes of thought. These positive outcomes emerged from experiences lasting only about one semester. Long-term, work-based learning could have more constructive impacts, especially since employers would be more likely to reap returns from training and providing responsibility to young workers.

Standard apprenticeships and youth apprenticeships offer in-depth, work-based learning combined with related course work. Though youth apprenticeships constitute the most intensive form of career-focused education and training, youth apprenticeships and other (including registered) apprenticeships have been the least studied major intervention. Despite the widespread, long-term use of apprenticeships in some countries and their resurgence in others, few rigorous studies have examined how entering and completing apprenticeships in the United States affects the education, job skills, non-academic skills, and job market outcomes of young people.

Students generally report high levels of satisfaction with apprenticeships. Of those involved in Wisconsin's youth apprenticeship, most stated that their worksite learning

experiences were excellent and 84-86% that apprenticeships improved their problem-solving and teamwork skills (Scribner and Wakelyn 1998). Instructors and employers indicated that apprentices improved their social and interpersonal skills, develop independent decision-making skills, and increase their self-confidence and self-esteem. Participants in a Wisconsin youth apprenticeship in printing achieved earnings levels substantially above expected earnings for similar youth (Orr 1995). Other evidence suggests that youth apprenticeships motivate participants to do better in school and pursue difficult courses broadly related to their occupational interests (Hamilton and Hamilton 1997). In addition, apprentices learn from mentors about the culture of the workplace, about the opportunities and requirements within the career area, and about dealing with personal and social issues.

Ethnographic evidence supports the idea that well-structured programs that include work-based learning can enhance non-academic as well as occupational skills. Robert Halpern (2009) undertook in-depth, observational studies of high school youth apprenticeships, examining 24 programs involving nearly 500 apprentices, conducting over 300 hours of observation and over 90 interviews with adult mentors, staff, program directors, and students. One example is After School Matters, which engaged inner-city Chicago high school students in 1-2 year programs for 2-3 afternoons per week in fields such as video and computer technology, culinary arts, and design. Halpern also followed students in Wisconsin's youth apprenticeship program. His rich qualitative analysis yields several notable perspectives. Halpern points out that apprentices gradually develop expertise in an occupational area as well as problem-solving, self-confidence, teamwork, the ability to take direction and take the initiative, and other non-academic, employability skills. Participating youth see themselves judged by the established standards of a discipline, including deadlines and the constraints and unexpected difficulties that arise in the profession. To quote Halpern, "Young people learn through observation, imitation, trial and error, and reiteration; in other words through force of experience. Though professionalism and care are expected, perfection is not. Adult mentors hold the discipline for the apprentice, sequencing and controlling task demands to keep them on the constructive side of difficulty."

The demands and responsibilities placed on apprentices increase the speed of their maturation process. Apprentices see deadlines within the workplace as real and as affecting the viability of the firm and its jobs, unlike the artificial deadlines set by teachers. Apprentices learn from mentors to take pride in their work; Rose (2004) points to electrical apprentices who emulate their instructors' pride in laying proper electrical wiring though the work will never be seen. Apprentices aspire to mastery in an occupation and becoming part of a community of practice.

Utilizing workplaces as learning locations can be linked to several strands of research and analysis. It builds on evidence of the importance of occupational skills and other non-academic, employability skills. It is consistent with evidence on the effectiveness of sectoral approaches and of employer-based training, including on-the-job training.<sup>5</sup> It offers good options for meeting such youth development goals as personal autonomy and efficacy, motivation, and realism and optimism, and knowledge of vocations. By linking career-oriented education and training to apprenticeship slots provided by employers, the approach does better in responding to the labor market than having career-oriented offerings tied to available teachers or to historical programs. Evidence

from other countries show that the model helps students develop an occupational identity, a professional ethic, and self-esteem based on accomplishment (Rauner 2007).

A common argument against a career-oriented approach is that the mix of jobs changes so frequently that occupational skills easily become outmoded while academic skills are said to apply broadly and make future workers more adaptable. But, in fact, skills in broad-based occupational fields are often quite portable. For example, while only 42% of German apprentices stay in their initial occupation, nearly two-thirds remain with either the occupation they learned as an apprentice or another occupation in the cluster using a similar mix of skills. Clark and Fahr (2001) present workers' own views on how skills learned in apprenticeship training apply to their current jobs. Not surprisingly, 85% of workers remaining within their training occupation use many or very many of the skills they learned through apprenticeship. This group constitutes 55% of the sample. But, even among the remaining 45%, about two of five workers reported using many or very many of the skills from their apprenticeship and another 20% used some of the skills. Overall, only 18% of all former apprentices stated they used few or no skills learned in their apprenticeships.

One potential barrier to expanding apprenticeship in the U.S. is the unusually low union density in the private sector. It is indeed true that the collaboration between companies, unions, and the government plays a critical role in making apprenticeship successful in Germany (Eichhorst et al. 2013). However, unions are only modestly involved in the policy and operations of the highly developed and widely used Swiss apprenticeship system. Also, despite little union participation, England has managed to increase apprenticeships tenfold between the early 1990s and 2011. No doubt the U.S. faces a range of challenges in any attempt to bring apprenticeships to scale, but opportunities for expansion are worth noting as well (Lerman 2012).

A recent critique suggests that career-focused education, including apprenticeship, improves employment and earnings outcomes of young people but the advantage erodes to a disadvantage at older ages (Hanushek et al. 2011). According to the authors, the erosion of gains at older ages is clearest in countries that emphasize apprenticeship, such as Denmark, Germany, and Switzerland. Yet, according to several estimates in the paper, the advantage in employment rates linked to vocational education in the apprenticeship countries remains through approximately age 60 (Table 6 in Hanushek et al. 2011). Moreover, in the apprenticeship countries, the advantage in employment rates is sizable, providing men with vocational education a 9 percentage point higher employment rate at age 40 and a 4 point advantage at age 50.

The findings of the Hanushek, Wößmann, and Zhang paper are interesting, but subject to several limitations. The estimates cover a specific time period (1994 and 1998), using cross sections of people at varying ages to generate life-cycle patterns. They capture employment and earnings of different birth cohorts only at a specific age. The issue may be significant, given the specific years involved. Germany, in particular, went through an especially difficult period in the 1990s, having to absorb East Germany. At the time, German policies specifically tried to encourage early retirement and Germany's benefit system provided very high replacement rates for workers. Also, by including only those who completed at least secondary school, the estimates ignore the potentially positive effects of vocational education on reducing high school dropout rates.

### **A structured internship program for at-risk youth after leaving high school**

The Year-Up program provides low-income, mostly black and Hispanic 18-24 year-olds with full-time classes and six month internships to improve their skills, especially job-related skills. Applicants must take several active steps to enter the program, including submitting a written essay, letters of reference, a high school transcript and attendance records. The screening process explicitly focuses on the applicant's work ethic and commitment to the program. Thus, the pool of Year-Up applicants may have far more non-academic, employability skills and motivation than does the broader population of minority youth. During the first six months, students take classes involving business writing, time management, teamwork, problem-solving, and conflict resolution (Grobe et al. 2010). Students must maintain high attendance rates, be on time, and complete assignments. Those who repeatedly fail to meet these expectations are asked to leave the program. Additional skills taught include how to present oneself in terms of dress and body language, interact with co-workers, make small talk, engage in social networking, and manage conflict. In some cases, participants can be part of a dual enrollment program and earn credits with community colleges.

Students who complete the classes are placed in internships with leading U.S. companies. During their internships, participants continue to attend weekly classes where they share experiences about their internships, work on their resumes, do mock job interviews, and look into postsecondary options. The technical skills training includes word processing, spreadsheet, and presentation software, with some students learning about computer installation and repair and other students learning how to track portfolios.

The evaluation of early program impacts uses random assignment, but only with 195 treatment and control group members (Roder and Elliot 2011). The results look promising from the limited follow-up information and small samples. During the Year-Up program period, the treatment group earned less than controls since many were in full-time classes. However, by the second year after random assignment (beginning in the year after the program ended for this cohort), the treatment group averaged 30 percent higher earnings, a statistically significant and meaningful difference. As of 2009, Year-Up participants and controls had similar levels of employment and no statistically significant differences in hours worked. However, Year-Up participants got better jobs, probably because of the corporate connections of the founder of the program (Heinrich 2012/2013); 22 percent worked in information technology jobs compared to 2 percent of controls and 15 percent of participants worked in finance jobs such as portfolio administrators and fund accountants compared to no control group members. Most of the computer and finance jobs came when their internship was converted into a full-time position. Overall, one-quarter of the treatment group obtained jobs with their internship employer or another employer partner.

Managers and mentors are trained to provide frequent feedback to interns and to expose interns to various aspects of the business. By learning about potential workers during the internship phase, firms gain valuable information about which workers will perform best and deserve a job offer. But, interns may gain non-academic and occupational skills as well. Employers report that Year-Up interns bring a high level of professionalism, including networking, high motivation, commitment, enthusiasm, as well as significant technical skills useful on the job. Unfortunately, the evaluation did not examine changes in these skills for Year-Up participants relative to changes for the control group.

Caution is appropriate in judging these promising initial gains in Year-Up, since they are based on small samples and the program's linkages with employers and industries paying good wages and willing to hire screened Year-Up participants.

## Conclusions

The importance of non-academic and occupational skills for success in the labor market is becoming increasingly well-documented. Yet, at the same time, policymakers focus almost entirely on academic skills and educational attainment to prepare students for careers. The competitiveness of the U.S. workforce is viewed in terms of student rankings on academic test scores and on the share of young people completing a BA degree. The Obama Administration and most governors expect improvements in initial preparation for college and careers coming about from requiring a "common core" set of subjects that all students must take.

For the 22-25% of all students and 35-40% of Hispanic and African-American students who do not complete a conventional high school diploma, the American education system sanctions the use of an alternative high school credential, the GED. Those completing a high school diploma—regardless of their grades—or those passing a GED can enter a community college and take career-focused courses. Unfortunately, many young people never enter these colleges and for those who do, dropout rates are well beyond 50%. Moreover, these classroom-based courses often provide too little preparation in non-academic and occupational skills to become productive and succeed in the job market.

Still more research is necessary to establish proven approaches that insure students, young workers, and older workers learn the requisite skills in communication, discipline, teamwork, focus, ability to allocate time and other resources, and problem-solving. Efforts in this direction deal with the skills most lacking and most in demand by employers. Instead, many programs for at-risk youth focus on the GED. Yet, the research evidence and evidence from the program casts serious doubt on the value of the GED approach. Some programs that increase workplace skills with no impact on GED test completion (or even high school graduation) still improve outcomes in the job market. A good example is Career Academies, an initiative that raises the earnings of young men, especially at-risk young men. While having no effect on the completion of the GED test, high school graduation, or college attendance, Career Academies nonetheless raised the earnings of young men by 17 percent. The fact that such gains accrued to men but not women is consistent with other evidence showing that young women have higher non-academic and employability skills than young men (Jacob 2002).

Some other programs increase GED completion but have no effect on earnings. The Job Corps evaluation documents large positive impacts of a GED certificate for participants, but no accompanying significant earnings gains. While teaching non-academic skills is a goal of Job Corps, one sign of limited interest in important non-academic skills is the lack of quantitative measures to assess potential improvement in these skills.

In contrast, the National Guard Youth ChalleNGe emphasizes the strengthening of non-academic skills with at least as much importance as the teaching of academic skills in GED test and high school programs. Efforts to improve discipline, teamwork, problem-solving, time use, and other non-academic skills are central to the strategy of the ChalleNGe program. However, the estimated impacts at a point three years after



application are modest, with small, statistically significant gains in employment and earnings and in selected non-academic skills, such as time management, controlling one's temper, and how to lead others. To learn more about the effect of the ChalleNGe program on these skills, researchers will have to learn to measure the use of such skills in real world contexts and not simply based on survey evidence.

Projects are under way to verify these skills in the context of work-based learning programs. Under such programs, young people demonstrate their ability to undertake various tasks in workplaces and other venues in ways that allow for reliable measures of their attainment of non-academic skills. Program staff works to establish the opportunities and tasks that involve communication, focus, teamwork, problem-solving, and reliability. The staff evaluates the participants on a variety of criteria based on the participant's actual performance. Subsequently, the staff interacts with employers to determine whether there is agreement about participant performance. Out of this process comes a verified resume that can provide evidence of the mastery of these skills that is convincing to employers and presumably results in improved employment and earnings outcomes.

A range of program interventions show promise for helping people build and improve non-academic and vocational skills. But, the evidence on their impacts is thin because evaluators have rarely examined gains in productive personality traits, other non-academic skills, and occupational skills. Government agencies, foundations, and other sponsors of programs and demonstrations should do far more to recognize the importance of documenting and raising non-academic skills. Before a full experimental test, researcher should examine carefully a variety of potentially effective strategies. For example, under one recent, foundation-sponsored approach (the "Verified Resume"), young people are assessed on responsibility, teamwork, communication skills, acquiring and interpreting information, creativity, and negotiating toward reaching constructive agreements.<sup>6</sup> Mentors at community-based organizations dealing with youth not only try to foster these skills, but are also trained to make detailed assessments and have these assessments verified by employers. The process encourages participants to focus on and improve their employability skills and to document qualifications that employers find relevant. Once potential strategies are identified, they should be tested rigorously.

In addition to evaluations of individual programs, U.S. policymakers should learn from the wealth of experience across countries. One particularly attractive approach that emphasizes non-academic and occupational skills is apprenticeship training. It lowers the gaps between what is learned at school and how to apply these and other skills at the workplace. It matches training content to job opportunities. It allows trainees to learn, earn, and be productive at the same time. Transmitting skills to the workplace works well with supervisory support, interactive training, coaching, opportunities to perform what was learned in training, and keeping the training relevant to jobs (Pellegrino and Hilton 2012). These are common characteristics of apprenticeships. Further, because employers bear much of the costs of education and training, apprenticeships and other forms of employer-based training are far less costly to the government than school-based approaches. Finally, countries with the most robust apprenticeship systems experience relatively low youth unemployment.

While lacking a large apprenticeship system, U.S. programs sometimes incorporate work-based learning and close linkages between training and jobs. Although additional research will be required to identify best practices, so far combining academic with

work-based vocational approaches show promise in helping young people in the labor market and in enhancing their non-academic, employability skills.

## Endnotes

<sup>1</sup>Tyler et al. (2000) find a positive signaling effect of the GED on low-skill, white high school dropouts, but not for minorities.

<sup>2</sup>For an in-depth, philosophical treatment of the meaning of skills, see Attewall (1990).

<sup>3</sup>Heckman and Rubinstein (2001) make a similar point in showing that holding constant for ability measured with the Armed Forces Vocational Aptitude Battery, having a GED actually is associated with lower earnings relative to high school dropouts. Although GEDs seem to boost short-run earnings, holding non-cognitive skills constant, reductions in earnings emerge as GEDs reveal their adverse non-cognitive skills over time. Also see other evidence in Almlund et al. 2011, especially page 94.

<sup>4</sup>In a major book published over 35 years ago, Bowles and Gintis (1976) developed evidence showing that cognitive skills were far from the only or even the main determinant of earnings. They argued that schools aim to affect non-cognitive traits, such as obedience to superiors, by socializing students to function well and without complaint in the hierarchical structure of the modern corporation.

<sup>5</sup>For recent experimental evidence on the earnings gains achieved through sector-based programs, see the study by Maguire et al. (2010).

<sup>6</sup>The Open Society Institute-Baltimore, (OSI) assisted nine Community Based Organizations (CBOs) implement the Verified Resume Process, under the direction of Arnold Packer, former executive director of the SCANS commission. Information on this initiative came from an unpublished short paper by Mr. Packer. More information is available directly from [arnold.packer@gmail.com](mailto:arnold.packer@gmail.com).

## Competing interests

The IZA Journal of Labor Policy is committed to the IZA Guiding Principles of Research Integrity. The author declares that he has observed these principles.

## Acknowledgements

The author thanks James Heckman, Tim Kautz, the referee, and the editor for helpful comments. The author is grateful to the Smith Richardson Foundation for partial support for the research.  
Responsible Editor: David Neumark.

## Author details

<sup>1</sup>Urban Institute, 2100 M Street, NW, Washington DC 20027, USA. <sup>2</sup>American University, Washington DC, USA. <sup>3</sup>IZA, Bonn, Germany.

Received: 1 February 2013 Accepted: 19 April 2013

Published: 15 May 2013

## References

- Almlund M, Duckworth A, Heckman J, Kautz T (2011) Personality, Psychology, and Economics. In: Hanushek E, Machin SJ, Woessmann L (eds) *Handbook of the Economics of Education*, vol 4. Elsevier Press, Amsterdam
- Attewall P (1990) What is skill? *Work and Occupations* 17:422–448
- Bacolod MP, Blum BS (2010) Two Sides of the Same Coin: U.S. Residual Inequality and the Gender Gap. *J Hum Res* 45(1):197–242
- Bailey T, Hughes K, Moore D (2004) *Working knowledge: work-based learning and education reform*. Routledge, New York
- Barton P (2006) *High school reform and work: facing labor market realities*. Educational Testing Service, Princeton
- Bishop J, Mane F (2003) The impacts of school-business partnerships on the early labor market success of students. In: Stull W, Sanders N (eds) *The School-to-Work Movement: Origins and Destinations*. Praeger Press, Westport
- Borghans L, Duckworth AL, Heckman JJ, Weel B (2008) The economics and psychology of personality traits. *J Human Res* 43:4
- Bowles S, Gintis H (1976) *Schooling in capitalist America: educational reform and the contradictions of economic life*. Basic Books, New York
- Bowles S, Gintis H (2002) *Schooling in Capitalist America Revisited*. *Soc Ed* 75:1–18

- Carmona R (2007) Testimony before the Joint Economic Committee. US Congress
- Cattan S (2011) Heterogeneity and selection in the labor market. Thesis. University of Chicago
- Clark D, Fahr R (2001) The Promise of Workplace Training for Non-College-Bound Youth: Theory and Evidence from German Apprenticeship. IZA Discussion Paper No. 378, Bonn, Germany
- Deke J, Haimson J (2006) Valuing student competencies: which ones predict postsecondary education and earnings, and for whom? Mathematica Policy Research, Princeton
- Eichhorst W, Rodríguez-Planas N, Schmidl R, Zimmermann KF (2013) A Roadmap to Vocational Education and Training Systems Around the World. IZA discussion paper No. 7110, Bonn, Germany.
- Grobe T, Rosenblum E, Weissman T (2010) Dollars and sense: how "career first" programs like year up benefit youth and employers. Jobs for the Future, Boston
- Hahn A, Lerman RI (1985) What works in youth employment? National Planning Association, Washington
- Halpern R (2009) The means to grow up: reinventing apprenticeship as a developmental support in adolescence. Routledge, New York
- Hamilton MA, Hamilton SF (1997) Learning well at work: choices for quality. U.S. Department of Education and U.S. Department of Labor, Washington
- Hanushek E, Woessman L, Zhang L (2011) General education, vocational education and labor-market outcomes over the life-cycle, NBER Working Paper 17504
- Heckman J, LaFontaine P (2006) Bias-corrected estimates of GED returns. *J Lab Econ* 24(3):661–700
- Heckman J, Rubinstein Y (2001) The importance of noncognitive skills: lessons from the GED testing program. *Am Econ Rev* 91(2):145–149
- Heckman J, Stixrud J, Urzua S (2006) The effect of cognitive and non-cognitive abilities on labor market outcomes and social behavior. *J Lab Econ* 24(3):411–482
- Heckman JJ, Humphries JE, Urzua S, Veramendi G (2011) The effects of educational choices on labor market, health and social outcomes. Working Paper No. 2011-002. Human Capital and Economic Opportunity Working Group, University of Chicago.
- Heinrich C (2012/2013) How Does Year-Up Measure Up? *Focus* 29(2):13–17
- Hillage J, Regan J, Dickson J, McLoughlin K (2002) Employers skill survey: 2002. Research Report RR372. Department for Education and Skills, London
- Holzer H (1997) Is there a gap between employer skill needs and the skills of the work force? In: Lesgold A, Feuer M, Black A (eds) *Transitions in work and learning: implications for assessment*. National Academy Press, Washington
- Jacob B (2002) Where the boys aren't: non-cognitive skills, returns to school and the gender gap in higher education. *Econ Ed Rev* 21(6):589–598
- Johnson T, Gritz M, Jackson R, Burghardt J, Boussy C, Leonard J, Orians C (1999) National Job Corps study: report on the process analysis. U.S. Department of Labor, Washington
- Kemple J, Herlihy C, Smith T (2005) Making progress toward graduation: evidence from the talent development high school model. MDRC, New York
- Kemple J, Polinco S, Snipes J (1999) Career academies: building career awareness and work-based learning through employer partnerships. MDRC, New York
- Kemple J, Willner CJ (2008) Career academies: long-term impacts on labor market outcomes, educational attainment, and transitions to adulthood. MDRC, New York
- Kutner M, Greenberg E, Jin Y, Boyle B, Hsu YC, Dunleavy E (2007) Literacy in everyday life: results from the 2003 national assessment of adult literacy, NCES 2007-490. National Center for Education Statistics, Washington
- Lerman RI (2012) Expanding apprenticeship in the United States: barriers and opportunities. In: Fuller A, Unwin L (eds) *Contemporary Apprenticeship: International Perspectives on an Evolving Model of Learning*. Routledge, Oxford
- Lindqvist E, Vestman R (2011) The labor market returns to cognitive and noncognitive ability: evidence from the Swedish enlistment. *Am Econ J Appl Econ* 3(1):101–128
- Maguire S, Freely J, Clymer C, Conway M, Schwartz D (2010) Tuning into local labor markets: findings from the sectoral employment impact study. PPV, Philadelphia
- Millenky M, Bloom D, Dillon C (2010) Making the transition: interim results of the national guard youth ChalleNge evaluation. Manpower Demonstration Research Corporation, New York
- Millenky M, Bloom D, Muller-Ravett S, Broadus J (2011) Staying on course: three-year results of the national guard youth ChalleNge evaluation. MDRC, New York
- Murnane R, Levy F (1996) Teaching the new basic skills: principles for educating children to thrive in a changing economy. The Free Press, New York
- National Commission on Excellence in Education (1983) A nation at risk: the imperative for educational reform. U.S. Department of Education, Washington
- Nelsen B (1997) Should social skills be in the vocational curriculum? evidence from the automotive repair field. In: Lesgold A, Feuer M, Black A (eds) *Transitions in work and learning: implications for assessment*. National Academy Press, Washington
- Neumark D, Rothstein D (2007) Do school-to-work programs help the "forgotten half"? In: Neumark D (ed) *Improving school-to-work transitions*. Russell Sage, New York
- Orr L, Bloom H, Bell S, Doolittle F, Lin W, Cave G (1996) Does training for the disadvantaged work? evidence from the national JTPA study. Urban Institute Press, Washington
- Orr MT (1995) Wisconsin youth apprenticeship program in printing. Jobs for the Future, Boston
- Page L (2011) Understanding the impact of career academy high schools on long-term labor market outcomes: Bayesian estimation of causal effects in a random assignment study with partial compliance. PhD Dissertation. Harvard School of Education, Cambridge, MA
- Pellegrino JW, Hilton ML (eds) (2012) Education for life and work: developing transferable knowledge and skills in the 21st century. National Research Council, Washington
- Rauner F (2007) Vocational education and training: a European perspective. In: Brown A, Kirpal S, Rauner F (eds) *Identities at Work*. Springer, Dordrecht

- Rivera-Batiz F (2003) The impact of the school-to-work program on minority youth. In: Stull W, Sanders N (eds) *The school-to-work movement: origins and destinations*. Praeger Press, Westport
- Roder A, Elliot M (2011) A promising start: year-up's initial impacts on young adults' careers. Economic Mobility Corporation, New York
- Rose M (2004) *The Mind at Work*. Viking Penguin Books, New York
- Schochet P, Burghardt J, McConnell S (2008) Does Job Corps work? impact findings from the National Job Corps study. *Am Econ Rev* 98(5):1864–1886
- Schochet P, McConnell S, Burghardt J (2006) National job corps study and longer-term follow-up study: impact and benefit-cost findings using survey and summary earnings records data. U.S. Department of Labor, Employment and Training Administration, Washington
- Scribner J, Wakelyn D (1998) Youth apprenticeship experiences in Wisconsin: a stakeholder-based evaluation. *High School J* 82(1):24–34
- Secretary's Commission on Achieving Necessary Skills (1992) *Learning a living: a blueprint for high performance*. A SCANS Report for America 2000. U.S. Department of Labor, Washington
- Shipler D (2004) *The Working Poor: Invisible in America*. Knopf, New York
- Smith E, Comyn P (2003) The development of employability skills in novice workers. National Centre for Vocational Education Research, Adelaide, Australia, [http://www.forschungsnetzwerk.at/downloadpub/nr2005\\_ncver\\_australia.pdf](http://www.forschungsnetzwerk.at/downloadpub/nr2005_ncver_australia.pdf)
- Stasz C (2001) Assessing skills for work: two perspectives. *Oxford Econ Papers* 3:385–405
- Tyler J (2004) Basic skills and the earnings of dropouts. *Econ Ed Rev* 23:221–235
- Tyler J, Murnane R, Willett R (2000) Estimating the labor market signaling value of the GED. *Q J Econ* 115(2):431–468
- Washington Workforce Training Board (2008) 2007 Washington state employers workforce needs and practices survey, statewide report, <http://www.wtb.wa.gov/Documents/StatewideSurvey07.pdf>. Accessed : January 10, 2011
- Westwood A (2004) Skills that matter and shortages that don't. In: Warchurst C, Grugulis I, Keep E (eds) *The Skills That Matter*. Palgrave-Macmillan, New York
- Zemsky R (1997) Skills and the economy: an employer context for understanding the School-to-work transition. In: Lesgold A, Feuer M, Black A (eds) *Transitions in work and learning: implications for assessment*. National Academy Press, Washington

doi:10.1186/2193-9004-2-6

**Cite this article as:** Lerman: **Are employability skills learned in U.S. youth education and training programs?**. *IZA Journal of Labor Policy* 2013 **2**:6.

**Submit your manuscript to a SpringerOpen<sup>®</sup> journal and benefit from:**

- ▶ Convenient online submission
- ▶ Rigorous peer review
- ▶ Immediate publication on acceptance
- ▶ Open access: articles freely available online
- ▶ High visibility within the field
- ▶ Retaining the copyright to your article

---

Submit your next manuscript at ▶ [springeropen.com](http://springeropen.com)

---