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RESEARCH BRIEF

At-a-Glance

TAKE-AWAYS

Evaluations should:

- Distinguish carefully between *gross outcomes* (such as how many young people attend college after high school) and *net impacts* (the extent to which these outcomes were caused by the policy or practice being studied, rather than by other factors).
- Explore whether policies and practices have different net impacts for certain subgroups within the high school population.

To understand the prospects for widespread replication of policies and practices that prove successful, the evaluations should also:

- Test them on a reasonably large scale in a variety of real-world settings.
- Include analyses of program implementation and cost.

Standards and performance indicators should take into account the fact that certain policies and practices can make a significant difference for at-risk students even when the outcomes for these students do not appear particularly favorable in an absolute sense.

Evaluating the Impact of Interventions That Promote Successful Transitions From High School

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INTRODUCTION

In today's information-based economy, it is more important than ever for students to attain the advanced skills needed to succeed after high school, whether they are continuing their studies, joining the workforce, or juggling both school and work. A number of policies and programs have been developed to prepare high school students for the transition to postsecondary education and employment. The interventions include, for example, efforts to enhance the rigor of high school curricula and to provide counseling, assessment, financial aid, and other supports to students. This Research Brief focuses on the challenges and opportunities presented in evaluating whether the interventions achieve their goals of increasing students' educational attainment, employment, and earnings after high school.[1]

THE CONTEXT

The current wave of high school reform provides a vehicle to conduct rigorous evaluations of various policies and programs, including those designed to prepare students for postsecondary education and employment. The accountability that is increasingly required of high schools will be made more meaningful by incorporating reliable evidence from these evaluations.

THE CHALLENGE OF DETERMINING EFFECTIVENESS

Evaluations that address the bottom-line question of the extent to which certain interventions increase students' success in postsecondary education and employment face a key challenge: It can be difficult to separate the effects of the intervention itself from other factors that might have contributed to the young people's experiences after high school.

The distinction between gross outcomes and net impacts. In determining whether interventions are effective, it is important to distinguish between *gross outcomes* (for example, how many young people attend college after high school) and *net impacts* (the extent to which these outcomes were caused by the intervention being studied). For example, knowing that 60% of the high school students in a particular program went on to college is meaningful only if there is a reliable measure (called the counterfactual) of how many would have attended college anyway, without participating in the program.

Determining the net impact of interventions. Some evaluators use large data sets, such as the National Educational Longitudinal Study of 1988 (NELS:88), NELS:88 follow-up surveys, the National Longitudinal Survey of Youth 1997 (NLSY97), and the National Longitudinal Transition Study (NLTS 1 and 2) to explore variations in postsecondary outcomes for students who were in particular programs or courses of study. Other evaluators try to isolate the effects of a program or course of study by comparing the educational and employment outcomes for students who participated in it with the outcomes for a matched group of similar students who did not.

Both approaches need to take into account the extent to which students' postsecondary outcomes may have been caused by factors other than the intervention being studied. Some of these factors can be particularly difficult to measure. For example, students who volunteer for a special college preparatory program may have different levels of motivation or family support to attend college compared to the students who are used as a comparison group in the research. Later differences in college enrollment for the two groups of students could well have been caused by the preexisting differences in motivation or family support, rather than by whether the students participated in the program.

The role of random assignment. The most reliable way to provide a benchmark of how students would have fared in the absence of the intervention is widely considered to be random assignment—a lottery-like process in which students, classrooms, or schools are assigned either to a group that receives the intervention being studied or to a control group that is precluded from receiving it. (The control group is typically free to participate in any other services available in the school and community.) If the assignment process is truly random and the research sample is large enough, there should be no systematic preintervention differences between the research groups. Any statistically significant differences in outcomes, therefore, can be confidently attributed to the effects of the intervention.

The expanded use of random assignment studies in educational settings is an important breakthrough in determining the effectiveness of specific interventions. However, this approach presents a number of operational and other challenges. For example, random assignment can be an objective and equitable way to allocate scarce program slots when the number of eligible and interested students substantially exceeds the available openings; however, the use of random assignment can be criticized for denying services to students if the demand for the program does not substantially exceed the available openings (Gueron, 2000). Therefore, many evaluations of high school reforms use other, quasi-experimental research methods, such as the comparative interrupted time series approach (see, for example, Kemple et al., 2005).

The discussion below first provides an overview of studies that used a variety of research methods to examine the impact of interventions on students' postsecondary experiences. The focus then turns to five large-scale, random assignment evaluations to highlight several key points for policymakers and administrators to consider.

OVERVIEW OF FINDINGS FROM OUTCOME STUDIES ON TRANSITIONS FROM HIGH SCHOOL

Individual studies and syntheses of the research (primarily reviewing evaluations that did not use random assignment) suggest that interventions to improve postsecondary education and employment have produced mixed results.

The National Educational Longitudinal Study of 1988 (NELS:88). This study followed a cohort of eighth-grade students from 1988 until 2000, when most of them were 26 years old. The study collected extensive information about school experiences, educational and occupational aspirations, and postsecondary experiences. Among the findings from analyses of the NELS:88 follow-up are that:

- The academic intensity of the students' high school curriculum is the most important factor in determining momentum toward eventually attaining a bachelor's degree (Adelman, 2006).

- Higher performance scaled to the National Assessment of Educational Progress (NAEP) in mathematics is positively correlated with increased enrollment in postsecondary education, the selectivity of the postsecondary institutions that students attend, and the likelihood that the students receive a bachelor's degree (Scott & Ingels, 2007).
- Earning at least 20 credits by the end of the first year of college (2- or 4-year) is an important indicator that the student is on track to earn a degree. Therefore, beginning the transition process in high school with expanded dual enrollment programs that offer postsecondary course work and credits could provide momentum towards success in college (Adelman, 2006).
- Student effort beyond the regular school day is correlated with postsecondary aspirations. For example, almost 50% of students who spent at least 7 hours per week on homework planned to attend a 4-year institution, whereas only 8% of students who spent less than 1 hour per week on homework were planning to do so (Green et al., 1995).

National Assessment of Vocational Education (NAVE). Relying largely on NELS:88 data, NAVE reviewed the impact of programs funded by the Carl D. Perkins Vocational and Technical Education Act (Perkins III). The final NAVE report, completed under the guidance of an independent advisory panel, concluded that:

- Vocational courses (now called career and technical education, or CTE) improved later earnings for those students who enrolled in postsecondary education or training (the findings for students who did not pursue further education or training were less clear).
- The earnings gains associated with participation in vocational education were clearest in the short term and to some extent in the medium term (defined as 7 years after high school graduation), but it is not clear how much these effects persist beyond that point.
- Although vocational course taking in high school had no effect on overall enrollment in postsecondary education, it was associated with reduced enrollment in 4-year colleges compared to enrollment in 2-year colleges or certificate programs.
- It appears that students' postsecondary outcomes improve if they take both a vocational program of study and a strong academic curriculum (Silverberg et al., 2004).

Talent Search. The federally funded Talent Search program primarily provides three categories of services: (a) academic support (such as test-taking and study skills, as well as advice to students on selecting courses that prepare them for college); (b) career development (such as college orientation activities, visits to college campuses, and counseling); and (c) financial aid (such as individual financial aid counseling, group workshops, assistance with Free Application for Federal Student Aid (FAFSA) forms, and scholarship searches).

Constantine and colleagues (2006) used administrative data to compare outcomes for students who participated in Talent Search in three states with outcomes for similar students in the same or other schools. Talent Search participants' enrollment in a public college or university in their state was between 6 and 18 percentage points higher than that of nonparticipants, depending on the state. (The data collection did not extend to enrollment in other types of institutions.) The type of postsecondary institution that hosted the Talent Search project appeared to affect the outcomes. Thus, for example, students participating in Talent Search projects hosted by 2-year colleges were more likely to enroll in 2-year colleges themselves.

The Talent Search study suggests that an effective approach may be assisting low-income students who have college aspirations in overcoming information barriers. The evaluators particularly encouraged offering practical information, such as direct guidance on how to complete applications for college and financial aid, as well as orienting students to what college campuses are like.

Transition support for students with disabilities. The National Longitudinal Transition Study-2 (www.nlts2.org) is a rich source of information on the postsecondary experiences of students with disabilities. Among the findings from the study are:

- While the rate of attending postsecondary education by young people with disabilities has increased, it is still only about half that of their peers in the general population, with much of the enrollment for students with disabilities being in community colleges.
- Factors that appear to be associated with enrollment in college include students' having higher functional cognitive skills, being female, having a better educated head of household, and having progressed to the next grade level each year of high school.
- The patterns of postsecondary experiences differ markedly, depending on the category of disability (Wagner et al., 2006).

A useful source of information on evidence-based transition practices for students with disabilities can be found on the Web site of the National Secondary Transition Technical Assistance Center (www.nsttac.org), which has reviewed studies in such areas as student-focused planning (e.g., Individualized Education Program [IEP] development and student participation in planning), family involvement, and interagency collaboration. A review of the literature by Kohler and Field (2003) concluded that measures such as vocational education, paid work experience, parental involvement, and interagency collaboration had a positive impact on student outcomes. An intervention that included coaching youths in the application of student-directed planning skills, peer-based mentorship, and parent support, as well as in-service education for school transition staff produced significant increases in students' involvement in transition planning activities and transition awareness (Powers et al., 2001).

Other studies. Among the findings from other studies on transitions from high school:

- Reviewing a number of evaluations of Career Academies (see Table 1 on page 5 for a description of the program model), Stern and colleagues (2007) concluded that Academy students outperform non-Academy students on various measures of academic success while in high school. Differences in postsecondary education and employment were less clear, but where significant differences were found, they favored Academy students.
- In a study using NLSY97 data, DeLuca and colleagues (2006) found that participation in career-related programs does not generally affect college attendance, but taking a higher number of CTE courses compared to academic courses is associated with reduced college attendance.
- Also using NLSY97 data, Neumark and Rothstein (2007) explored the effect of school-to-work programs for students who were not likely to attend college in the absence of these programs. The authors concluded that several types of interventions—such as mentoring, co-op programs, and internships and apprenticeships—could improve either educational or employment outcomes (or both) for male high school students. The results for female students were less clear, although the authors noted that there might be post-high school labor-market benefits for females as well.

FINDINGS FROM STUDIES USING RANDOM ASSIGNMENT

In addition to using a random assignment research design, each of the five studies described below: (a) examined an intervention that operated in multiple schools or locations, (b) had reasonably large sample sizes, and (c) analyzed follow-up data on students' postsecondary experiences or on high school outcomes that are likely to directly affect these postsecondary experiences. The basic elements of the five interventions are presented in Table 1.

TABLE 1

Summary of Interventions Evaluated With a Random Assignment Design[2]

Career Academies

- "School-within-a-school" structure from grades 9 or 10 through grade 12
- Combined academic and occupational curricula around a career theme, such as health care or business and finance
- Employer partnerships to provide career awareness activities and work internships related to the career theme

Upward Bound

- Instruction, tutoring, counseling, and regular meetings during the school year, beginning in grade 9 or 10, with an emphasis on challenging college-preparatory courses
- An intensive, full-day academic program for about 6 weeks each summer, including after senior year
- Cultural activities, college tours, and help with applying for financial aid for college

Career Beginnings

- Collaboration among a local college (which serves as the program sponsor), the public schools, and businesses
- Summer jobs between junior and senior year
- Workshops and classes during that summer and in senior year on topics such as taking college entrance examinations and applying for financial aid, along with such activities as college and career fairs
- Counseling on educational and career choices
- Adult mentors serve as role models who actively assist youths in planning for the future

Quantum Opportunity Program

- Up to 5 years of year-round services, beginning in grade 8
- Comprehensive range of services, including mentoring, afterschool tutoring, community service activities, computer-based instruction, summer jobs, cultural opportunities, and tours of college campuses
- Cash stipends plus deposits in an accrual account to be used for postsecondary education or approved training programs

Math-Enhanced Learning in Career and Technical Education

- Extended professional development in which mathematics teachers partner with CTE teachers to provide ongoing support (but mathematics teachers do not teach in the CTE classrooms)
- Collaborative development of lesson plans
- Emphasis on the importance of mathematics as a workplace skill and identifying opportunities to teach mathematics concepts as they naturally occur in the curriculum

Career Academies. These small learning communities that combine career education and academic content are estimated to operate in more than 1,500 high schools across the country. A study by Kemple (2004) followed Career Academy students (compared to a randomly assigned control group) in nine high schools for 4 years after their scheduled high school graduation. Key findings on transitions after high school include:

- Career Academies produced positive and sustained impacts on a range of labor market outcomes for young men, a group that has experienced a severe decline in real earnings in recent years. Through a combination of increased wages, hours worked, and employment stability, the young men in the Academy group earned $10,000 (18%) more than those in the non-Academy control group over the 4-year follow-up period.
- Career Academies had no significant effect on the labor market outcomes of young women. The study's author suggests that this may be due, in part, to the fact that the young women in both the Academy and the non-Academy groups were more likely than the young men to be attending school or taking care of children.
- The positive labor market effects were concentrated among Academy group members who were at high or medium risk of dropping out of high school when they entered the programs.
- Although nearly 80% of the Academy group enrolled in some form of postsecondary education during the 4-year follow-up period, this percentage was not higher than the enrollment in postsecondary education by the non-Academy group. It is noteworthy, however, that the improved labor-market outcomes for young men did not reduce their pursuit of postsecondary education during the follow-up period compared to the control group.

Upward Bound. Upward Bound is a longstanding, federally funded program that provides academic instruction and other supports to prepare low-income students for college. It currently operates in more than 700 locations around the country. An impact evaluation conducted by Myers and colleagues (2004) included a nationally representative sample of 67 Upward Bound projects hosted by 2- and 4-year colleges. Based on follow-up data covering a period when the majority of the research sample had been out of high school for about 2 years, the evaluators found that:

- Almost three-fourths of students in both the Upward Bound group and the control group attended some form of postsecondary education. Upward Bound had no effect on overall enrollment or total credits earned, but it may have increased the proportion who enrolled in 4-year colleges.
- Upward Bound more than doubled (from 18% to 38%) the eventual enrollment in 4-year colleges for students who had lower expectations of attending such a college when they applied to the Upward Bound program in grade 9 or 10. There was no effect on 4-year college enrollment for students with higher educational expectations when they applied to the program.
- Upward Bound also at least doubled the number of credits earned at 4-year colleges by students who initially had lower educational expectations. Again, there was no effect for those with higher educational expectations.

Career Beginnings. This program model is aimed at high school juniors from low-income families who have shown perseverance in their schoolwork but are not among the top students in their class. In an evaluation of programs in seven urban areas, follow-up data through roughly 1 year after scheduled high school graduation showed that:

- Even though members of the control group received more services and had higher college attendance than anticipated, Career Beginnings led to increased college attendance. During the follow-up year, 53.2% of the Career Beginnings group attended a 2- or 4-year college, an increase of 4.7 percentage points over the figure for the control group.

- This increase in college attendance was, however, accompanied by decreased enrollment in vocational schools. Therefore, participation in Career Beginnings caused a shift in the type of postsecondary education rather than an increase in the overall rate of enrollment in postsecondary education.
- The Career Beginnings group initially worked less and earned less than the control group, but this earnings differential disappeared by the end of the follow-up period.
- The effect on college attendance varied considerably among the seven sites, but no clear story emerged about differential program effectiveness for subgroups such as young men and young women (Cave & Quint, 1990).

Quantum Opportunity Program (QOP). Operating in seven cities, QOP offered students in the lower two-thirds of their eighth-grade class up to 5 years of comprehensive, year-round services. In addition, for every hour of participation, QOP enrollees earned both a cash stipend and a deposit in an accrual account to be used for postsecondary education or approved training programs.

Nearly 1,100 QOP-eligible students were randomly assigned to either the program or the control group. The research sample was followed for nearly 5 years after their scheduled high school graduation date. The evaluators noted that the seven sites varied considerably in their implementation of the QOP model, with enrollees attending fewer program activities than expected. With respect to the program's effects, the study found that:

- QOP did not increase the enrollees' likelihood of graduating from high school with a diploma or GED.
- Although there had been an indication of increased entry into postsecondary education or training when QOP enrollees were in their late teens and early twenties, this effect was not sustained as the research sample entered their mid-twenties. For those sample members who did enroll in postsecondary education or training, the eventual attainment of postsecondary credentials was no greater for the QOP group than for the control group.
- At the time of the final follow-up, when the members of the research sample were entering their mid-twenties, QOP enrollment had not led to increased employment or earnings (Schirm et al., 2006).

Math-enhanced learning in career and technical education classes. In this study, career and technical education (CTE) teachers who volunteered to participate were randomly assigned to one of two groups: The first group was paired with mathematics teachers in a community of practice to develop CTE instructional activities that integrated more mathematics into the occupational curriculum; the second group taught their CTE classes as usual. Stone and colleagues (2006) found that, after 1 year of math-enhanced CTE lessons averaging 10% of class time:

- Students in math-in-CTE classrooms showed "moderate to medium" improvements, compared to students in the control classrooms, on standardized tests of mathematical achievement.
- The additional time spent on mathematics in these classrooms did not detract from students' acquisition of technical skills and knowledge in occupational areas.
- Students in the math-in-CTE classrooms had higher scores on a widely used college placement test, suggesting that they might be less in need of remedial courses at the postsecondary level.

INTERPRETATION AND IMPLICATIONS OF THE FINDINGS

A number of important lessons can be drawn from these random assignment evaluations:

The effect of other available services. In each of the studies, the members of the control group did not receive the particular intervention being tested, but they remained eligible for other services in their schools and communities.

Especially if applicants to a program are highly motivated—as was the case, for example, in Career Beginnings—the control group can be expected to find and use these other services.

The net impact findings should therefore be interpreted as the incremental impact of the interventions *over and above* the mix of alternative available services. The evaluations do not assess the effects of the interventions compared to a no-service control group.[3] The studies suggest the need for program planners to consider precisely how a new offering will fit within and enhance the range of services that are already available, especially for motivated students.

The size of the impacts. The net impacts found in rigorous evaluations are often more modest than policymakers and administrators have come to expect from the operating data that they typically see on program outcomes. This is because the operating data include what participants would have achieved even without the additional program services; as discussed earlier, the net impact of the program takes this into account by focusing on the *difference* between the experiences of the program enrollees and the experiences of the randomly assigned control group.

However, impacts of the size found on certain outcomes in these random assignment studies still provide a solid foundation on which to build. Technical assistance, professional development, and curriculum development can help sustain and extend these positive impacts (Grubb & Stern, 2007). For example, the Career Academies Support Network offers comprehensive support and staff development services to strengthen the operation of "small learning communities" and Career Academies. Similarly, the promising results of the math-in-CTE study have led the National Center for Career and Technical Education to offer assistance to states and schools interested in effective replication of the model.

Importance of analyzing subgroup results, including for students at risk and students with disabilities. The net impacts can differ for specific groups of students. For example, the Career Academies study found positive impacts on post-high school labor market outcomes for males but not for females. Moreover, the net impacts of interventions (i.e., the difference they make) are sometimes larger (or found only) for more at-risk students. This was the case for the labor market experiences of likely dropouts in the Career Academies study, as well as for enrollment in 4-year colleges by Upward Bound participants who began with low expectations of obtaining a bachelor's degree.[4]

The larger net impacts for more at-risk groups can occur even if their gross outcomes do not appear to be particularly favorable. For example, Upward Bound participants who initially had low expectations of obtaining a bachelor's degree were less likely to go on to 4-year colleges than those with higher initial expectations (38% compared with 56%). However, the Upward Bound program made no significant difference for the students with higher expectations, while it more than doubled the 4-year college-going rates for students who started with lower expectations.

Implications for targeting of programs and operating indicators. The Career Academies and Upward Bound findings, in particular, suggest that it can be important for programs to reach out to serve at-risk students. To the extent possible, however, these students should be included in programs that serve students with a range of abilities; otherwise, teachers and students might have lower expectations of the programs, seeing them as weaker, remedial efforts (Kemple, 2004; Moore & Myers, 2004).

The standards and performance indicators used to measure the success of programs need to take into account the lower outcomes that can result from serving larger numbers of at-risk students, where the net impact of the program may nevertheless be substantial (Moore & Myers, 2004). Unless standards and performance indicators are adjusted, they could inadvertently underestimate the effectiveness of the programs serving at-risk students and inappropriately reward programs simply for serving higher performing students.

CONCLUSION

Policymakers, administrators, and researchers need to work together to determine which interventions are most effective in preparing students for post-high school transitions. Expanded use of random assignment studies should continue to the extent feasible, along with efforts to strengthen alternative, quasi-experimental methodologies. Net impact studies should be conducted at scale in real-world settings and be accompanied by analyses of program implementation and costs. This will provide a better understanding of the prospects for widespread replication of successful efforts.

Conducting these evaluations poses considerable challenges, but it can also improve high school accountability. In particular, incorporating the results of rigorous evaluations will help ensure that standards and performance indicators reward those who make a real difference for the students they serve.

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END NOTES

[1] See also the companion Issue Brief, Bangser, M. (2008). *Preparing high school students for successful transitions to postsecondary education and employment.* Washington, DC: American Institutes for Research, National High School Center. The Issue Brief offers program design and implementation lessons for policymakers and administrators to consider.

[2] This table is based on the evaluators' descriptions of the programs at the time of the study; the programs' current operations might differ.

[3] The net impacts can also be affected by the fact that some of the students who are randomly assigned to receive the intervention either do not participate at all, or they participate for a relatively short time or less intensively than the program design envisioned (Kemple, 2004; Schirm et al., 2006).

[4] A similar result was found in the Structured Training and Employment Transitional Services (STETS) demonstration, which did not focus specifically on transitions from high school but did provide employment-related services to 18- to 24-year-old young adults with mental retardation. STETS increased the regular, unsubsidized employment rates for participants with moderate or mild retardation, but it had no impact on regular job holding for participants in the borderline range (Kerachsky et al., 1985).