



## Career and Technical Education: Research Roundup

BY EDUTOPIA STAFF

Career academies have been around in one form or another for four decades, but these days they're in a groove. It's not often in education research that numerous studies reach similar conclusions on the same subject. So reform-minded educators and lawmakers paid heed to the positive notices for career and technical education. We asked leading researchers to analyze the leading studies on different models of career and technical education. David Stern, principal investigator for the *Career Academy Support Network (1)* and Emeritus Professor of Education at the University of California, Berkeley, reviews career academies, while Marisa Saunders and Erica Hamilton with the Institute for Democracy, Education and Access at the University of California, Los Angeles, examine the newer Linked Learning approach. Here's what they found:

\* From *Vocational Education to Career-Technical Education: A Capsule History and Summary of Research* by David Stern (Univ. of California, Berkeley)

\* *Linking Learning to Life: A High School Transformation Effort* by Marisa Saunders and Erica Hamilton (Univ. of California, Los Angeles)

### **From Vocational Education to Career-Technical Education: A Capsule History and Summary of Research**

By **David Stern**

University of California, Berkeley

In the 1980s, what was then called vocational education (VE) started evolving toward what is now called career-technical education (CTE). VE courses were explicitly intended to prepare high school students for direct entry into full-time work -- not for college or university. In contrast, CTE courses are meant to fit together with classes in academic subjects so that high school students are prepared both for work and for postsecondary education.

The change from VE to CTE is apparent in federal legislation. The 1917 law that first authorized federal support for VE stipulated "that such education shall be of less than college grade." As recently as 1998, the federal VE law continued to define it as preparation for careers "other than careers requiring a baccalaureate, master's, or doctoral degree." But the 2006 reauthorization, which replaced the term "vocational" with

"career and technical," finally eliminated the prohibition against preparing for careers that require a bachelor's or advanced degree.

Patterns of course-taking by high school students show a dramatic shift away from VE as a separate track. Among high school graduates who completed an occupational course sequence, the number who also completed the academic coursework expected for college jumped from 28 percent in 1982 to 88 percent in 2000. Thus almost all students who take an occupational course sequence are now also completing the academic core curriculum.

Several high school reform efforts have promoted the movement from VE to CTE. One of the most important is *High Schools That Work (HSTW) (2)*, led by Gene Bottoms. Launched in 1987, *HSTW* aims "to prepare students for careers and further education by improving curriculum and instruction in high schools." *HSTW* now includes more than 1,200 sites in 32 states.

The spread of career academies also has contributed to the movement from VE to CTE. The career academy model **(3)** was invented in Philadelphia in 1969 and spread to California and New York City during the 1980s. *Available evidence (download) (4)* suggests the number of career academies nationwide has grown to about 7,000. A career academy is a small learning community within a larger high school, comprising a team of teachers who work with the same group of students during grades 10-12 or 9-12. Students at each grade level are scheduled together as a cohort to take a core set of academic classes and a technical class related to the theme of the academy (e.g., biotechnology, business, electronics, engineering, health, information technology, media and communications, among many others). Internships, mentorships, field trips, and other experiences link the school curriculum to the world of adult work. Career academies embody the CTE approach by fitting an occupational course sequence together with the academic coursework expected for college.

## Research on Impacts of VE and CTE

Evaluations of career academies *(download) (5)* provide the clearest evidence of benefits from combining an occupational course sequence with college-prep academic coursework. *Several studies (download) (6)* in the 1980s and 1990s found that career academy students had greater success in high school and beyond, compared to similar students from the same high schools. Career academy students generally showed more improved attendance, credits, and grades. One study found that career academy students from a large district who entered a local university were more likely to complete their bachelor's degrees than other students from that district.

But since students must apply to be part of a career academy, it is possible that academy students were more highly motivated to begin with, so their greater success might not all be attributable to the academy experience. To avoid this ambiguity, MDRC conducted a major evaluation in which students were randomly assigned either to a career academy or to the regular high school program.

MDRC's study corroborated many of the earlier results. Notably, among students most at risk, 79 percent of academy students stayed in school through spring of senior year, compared to 68 percent of the control group. Eight years after high school, *students assigned (7)* to academies had average monthly earnings of \$2,112, compared with \$1,896 for the control group. MDRC also found no significant differences in

postsecondary educational attainment between the two groups.

There is other evidence on the effects of traditional VE and newer CTE, but the evidence is more ambiguous. Research on traditional VE compared outcomes for high school graduates who did not go on to postsecondary education. Students who took traditional VE courses obtained higher average earnings after high school. However, VE students may have been more work-oriented to begin with. The appeal of traditional VE **(8)** has diminished as high school students realized that the highest-paying jobs required college degrees and set their sights on college in order to get these jobs.

CTE is meant to complement academic coursework. Several longitudinal studies in the 1980s and 1990s did find that high school students who took both an occupational course sequence and a core academic curriculum fared better after high school, both in the labor market and in postsecondary education. But these students may have been more highly motivated and well-organized to begin with, so it is not certain that their high school course-taking pattern accounts for their greater success.

*High Schools That Work (HSTW)* has required participating sites **(9)** to administer a set of achievement tests in reading, mathematics, and science. *HSTW* reports have shown improvement in the scores of seniors who completed a sequence of four or more courses in a particular occupational area. However, it is possible that these trends are due to occupational courses in *HSTW* schools attracting more high-achieving students than before. To determine how much the *HSTW* intervention contributes to improved student achievement, it would be necessary to compare with similar non-*HSTW* schools. For these reasons, the jury is still out **(10)** on whether *HSTW* actually causes gains in student achievement.

The evidence so far -- mainly the career academy evaluations and a recent study (download) **(11)** on math-enriched CTE -- provides strong support for continued expansion of career academies, and for extension of the CTE college-and-career approach through efforts such as *HSTW*, programs of study that connect secondary and postsecondary education, and the Linked Learning initiative of the James Irvine Foundation **(12)**. Evaluation of these new efforts will tell us whether a combined sequence of academic and CTE courses can benefit students not only in career academies but also in other educational settings.

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## Linking Learning to Life: A High School Transformation Effort

By **Marisa Saunders and Erica Hamilton**

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Alicia (pseudonyms are used in reference to student participants) devoted her junior year in high school to raising young people's awareness of

the environmental issues plaguing her community. Working for a real-world client -- an international non-profit -- Alicia created a multimedia campaign using solid science and social science arguments and the advanced graphic design and media skills she acquired in her high school classes. Alicia says these interdisciplinary projects, developed in collaboration with professionals in the field, have given her concrete career options. "That's their goal with every student," explained Alicia, "to try to get them to understand that it's not just high school... real life is coming quickly so you need to be prepared."

Alicia attends the school of Digital Media and Design (DMD), a public high school located in San Diego, California. DMD is one of a growing number of schools nationwide exploring a Linked Learning curricula. This approach to career technical education (CTE) challenges the high school practice of tracking students into either academic or trade-skills courses, by offering an integrated curriculum that prepares *all* students for college, career and civic participation.

Linked Learning seeks to transform high schools, but it's not a one-size-fits-all approach. Each school's program may differ in size, thematic focus, schedule, etc. However, all Linked Learning schools share four key components:

- College-preparatory coursework that prepare all students for success in colleges, universities, and other postsecondary programs. Courses use project-based learning or other engaging instructional strategies that provide real-world context and relevance to the curriculum.
- Professional/technical coursework for all students that is well-grounded in academic and professional standards.
- Field-based learning opportunities that expose students to real-world and workplace environments where they can learn from adults outside the school through mentorships, job-shadowing, virtual apprenticeships and project-based learning.
- Additional support services, including counseling and supplemental instruction to meet each student's particular needs. This critical component ensures all students are provided access and opportunities for success in both college and career preparatory coursework.

These strategies aren't new. *Career academies* **(13)**, for example, have been around for over 40 years. Although academies are not the only model for infusing a college-preparatory curriculum with a career theme, they are a well-researched approach.

Evaluations of career academies have shown a *positive impact (download)* **(14)** on academic outcomes such as high school attendance, credits earned, grade point averages, and graduation rates. *Research (download)* also suggests **(15)** that career academies have a positive effect on students' postsecondary opportunities including increased college attendance and increased earnings. What these studies do not take into account are the characteristics and motivation of students who choose to attend career academies. A random-assignment evaluation of career academies, conducted by MDRC, addresses this question of selection bias. This evaluation confirmed the positive outcomes found in previous studies, especially for students considered at high risk of dropping out when they entered the programs. The MDRC study also found that academy students have better knowledge of the range of careers and the skills they require. These findings provide *important evidence* **(16)** that participation in career academies increased post-high school graduation employment rates and earnings, without reducing college preparedness or postsecondary credential completion. Unfortunately, it is difficult to ascertain which Linked Learning components contribute to these positive

outcomes.

Additional studies of Linked Learning programs in California are underway. Preliminary findings are consistent with the optimistic evaluations of career academies. A current study of 10 Linked Learning programs in California, for example, has so far found that students in these programs have dramatically lower dropout rates and slightly higher graduation rates, than the state as a whole, and are more likely to graduate with the courses required for admission to California's public universities.

Linked Learning schools also appear to foster students' career and civic capacities. Eighty-nine percent of students at Linked Learning sites agreed that their school was preparing them for success in career, while 49% indicated that "helping others in the community" is "very important" compared to 35% of a national sample. Similarly, the number of Linked Learning students who responded that "correcting social and economic inequalities" is "very important" was almost double the rate of students in a national sample (34% vs. 18%). As one student commented, "It's a place for you to learn and learn about yourself and grow and do something that's beneficial for the community."

The potential of Linked Learning compels our attention, even with the challenges of bridging the long-standing divide between academic and job-training classes in high school. Upcoming research on effective implementation strategies and practices may ease that transformation.

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- 7 [www.mdrc.org/publications/482/overview.html](http://www.mdrc.org/publications/482/overview.html)
- 8 [muse.jhu.edu/journals/foc/summary/v019/19.1.stern.html](http://muse.jhu.edu/journals/foc/summary/v019/19.1.stern.html)
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