

The False Dichotomy between Academic Learning & Occupational Skills

Thomas R. Bailey & Clive R. Belfield

What distinctions are there between vocational (career and technical) education and academic learning in college? In this essay, we compare broad academic and vocational program goals, embodied skills, tasks, and jobs, with a focus primarily on community college students. There is considerable overlap between the two types of education, so a separation of tracks presents a false dichotomy. In addition, vocational certificates, which often have little academic content, have attracted attention lately as a path to good jobs. New evidence indicates that degrees offer more substantial advantages than certificates in the labor market. We argue for an alternative framework for thinking about the optimal accumulation of skills in college. Rejecting the traditional distinction between vocational education and academic learning, we posit that educational paths are best understood as accumulations of general education followed by terminal work-related education. We label this the Gen-Tech framework and consider its explanatory power and implications for colleges and students.

Going to college is one of the most important economic decisions a person can make. A substantial body of research indicates that the average student benefits from going to college. Yet there is persistent controversy regarding the costs and benefits of higher education. As tuition and fees have risen, many middle-class families have found the cost of college burdensome; as debt levels have risen and wages have stagnated, more students have questioned whether the benefits of college are too meager. In the last few years, this skepticism has taken on a more concrete form: rather than attending a traditional college (although “traditional college” is not always well defined), many students enroll instead in programs designed more specifically to prepare them for work. The rationale is that college students should focus on accumulating vocational skills over academic learning.

This tension has existed for a long time and is currently institutionalized by the distinction between “career and technical education” (CTE) and

“academic education” (at either two- or four-year colleges). We reject this distinction. We argue that it is based on an overly determinative notion of what skills workers acquire, need, and use, as well as an understanding of the evidence on the returns to vocational education that is insufficiently nuanced. Maintaining this distinction leads to a misguided stylization of educational pathways through college.

We propose an alternative framework for thinking about the optimal accumulation of skills in college. Specifically, we posit that educational paths are best understood as accumulations of general education followed by terminal work-related education. We label this the *Gen-Tech* framework and consider its explanatory power and implications for colleges and students, as well as for the future of education design.

Although many of these phenomena are present at four-year colleges, we focus primarily on community colleges because it is there that the tensions between short-term credentials and degrees and between academic and career and technical education are most salient. Moreover, even though four-year colleges explicitly prepare students for jobs, this instruction is not generally referred to as CTE. Our discussion does apply to some adults returning to college, but less so to adults who already have general skills and are returning for very specific occupational goals. For this reason, we emphasize that our discussion focuses primarily on the trajectories of younger students.

While short-term occupational or employer-based credentials have been a staple of community college offerings for decades, they have recently gained more public notice. Indeed, this trend is bipartisan.

In 2017 and 2018, Republicans argued for an emphasis on short-term credentials or employer-developed certifications, expressing skepticism about the liberal arts curriculum that forms the foundation of a traditional college education. The Trump administration has also been enthusiastic about short-term occupational credentials and apprenticeships, on the assumption that they offer a more direct route to good-paying jobs without a diversion through academic instruction.

But Democrats and progressives have made similar arguments for many years, expressing skepticism about the “college for all” ethic (by which they generally mean a four-year college for all) and highlighting the benefits of short-term occupationally specific certificates, which often have minimal general education content. At the community college level, one advantage of these programs is that they often do not have academic prerequisites and therefore do not require students with weak academic skills to undergo remediation. Remediation is sometimes incorporated into substantive courses, but in general,

certificate programs get students in and out quickly with a specific job goal. Whatever these students may lose in general skills is compensated by a greater probability of completion and better immediate access to jobs. At least for students with weak academic skills and adults returning to school to upgrade skills, advocates argue that trading off the amorphous benefits of general skills for a certificate that leads to a concrete job is well worth it. Progressives have long been enthusiastic about apprenticeships as well. For example, rooted in a favorable view of European apprenticeship programs, Congress during the Clinton administration passed the School-to-Work Opportunity Act.

The tension between occupationally focused and academic instruction has a long history. The Smith-Hughes National Vocational Education Act of 1917 – inspired partly by a perception of German advantages in education and training – provided federal funds for “agriculture, trades and industry, and homemaking.”¹ However, the Smith-Hughes Act led to vocational education being differentiated from other types of education within schools, and it generated an enduring constituency to the design and administration of the state-level activities funded by the Act. Since 1917, the Act has been replaced and renamed several times. “Vocational education” was changed to “vocation and technical education” and, later, “career and technical education”; “vocational” had taken on a pejorative connotation, characterized by a perception of narrow high school courses that were thought to track students into “dead-end” careers. This shift was accompanied by a call for the integration of academic education into vocational programs. This was based, in turn, on the idea that in the modern economy, academic skills were useful for some vocations: modern technology and work organization required all workers to be able to read, write, and communicate effectively. At the same time, however, new pedagogic perspectives suggested that general academic learning would be improved if it relied on more practical applications. Despite the blurring of the distinctions between academic and vocational learning, the century-old Smith Hughes Act and definitions therein have been repeatedly reinforced and reauthorized, most recently in 2018 as the Strengthening Career and Technical Education for the 21st Century (Perkins V) Act.

Thus, in the current labor market, CTE is advanced as a preferred route through postsecondary education for many students.

The distinction between career and technical education and academic education – along with the view that the former is superior to the latter – is a false dichotomy. We contrast the two in terms of their program goals, embodied skills, and implications for the jobs of college-educated workers.

One way to explore what distinguishes CTE programs is to look at the types of skills that these programs are designed to teach. Advance CTE is an organization of the “State Directors and state leaders responsible for secondary, post-secondary and adult Career Technical Education (CTE) across all 50 states and U.S. territories”;² it lists the following twelve “Career Ready Practices ...intended to establish goals for CTE programs”:

- Act as a responsible and contributing citizen and employee;
- Apply appropriate academic and technical skills;
- Attend to personal health and financial well-being;
- Communicate clearly and effectively and with reason;
- Consider the environmental, social, and economic impacts of decisions;
- Demonstrate creativity and innovation;
- Employ valid and reliable research strategies;
- Utilize critical thinking to make sense of problems and persevere in solving them;
- Model integrity, ethical leadership, and effective management;
- Plan education and career paths aligned to personal goals;
- Use technology to enhance productivity;
- Work productively in teams while using cultural global competence.³

But this is a good set of goals for any educational program, and all occupations but the most menial. Certainly, it applies to the types of careers that “academic” students aspire to and could easily characterize the goals of a liberal arts education.

An alternative way to understand the need for different types of vocational or academic education is to look at the skills required by employers. Workers’ skills may be vocationally specific (such as knowing calculus as an engineer) or general (such as diligence), and we might expect that employers would talk primarily of the vocational skills required for their particular needs.

But employers often claim they are seeking general academic skills. More than three-quarters of the executives and hiring managers interviewed in a 2018 survey by Hart Research Associates listed as “very important” for recent college graduates they were hiring skills that encompassed the ability to effectively communicate orally; work in teams and independently; communicate in writing; and apply knowledge/skills to real-world settings. The list of skills for college graduates also emphasized a set of character traits – ethical judgment, decision-making, or self-motivation – that is identical to the Advance CTE list above. Yet these skills and traits often require years of education to develop properly and it is difficult to see how they could do so in a short certificate program.

Analysis of job announcements reinforces the desirability of general skills. From a review of thousands of job postings, public policy scholar David Deming and economist Lisa Kahn identified ten job skills that employers claim to want.⁴ Of these ten skills, three do appear to be directly technical (financial, computer, and software skills). Two skills appear to be quite general (social skills and character skills); college may help with these, but they are not contingent on whether the student is in a general or vocational program. Similarly, three other skills appear to involve managerial tasks (customer service, and project and people management) that are not typically conveyed in career and technical education. Finally, two of the most important skills – those most likely to be found in job postings – are labeled “cognitive skills” and “writing skills.” Both are academic and are more likely – or certainly as likely – to be part of a general studies curriculum spanning both high school and college than to be part of a vocational curriculum. In fact, many job postings require both cognitive and social skills, so a balanced postsecondary education seems optimal.

When we turn to what happens in the workplace, the sense of what constitutes college-level vocational skills becomes even more nebulous. Workers possess skills that they acquired in college. Yet jobs are bundles of tasks that employers ask workers to perform. Workers may have skills that they use only infrequently (such as complex calculations) and others that they use a lot (such as managing social situations). It is challenging to identify college skills that relate directly to labor market tasks, and to demarcate those skills as vocational rather than academic.

Jobs throughout the economy involve a very wide range of tasks at varying levels of competency. Social scientists try to identify needed tasks by examining the activities carried out within occupations. But occupational mapping is not a precise science. Existing maps produced by economists suggest that the U.S. workforce is grossly overqualified, with perhaps as many as one-third of the workforce having college degrees they do not need. In light of data on the high returns to college, this one-third figure seems dubious.

The correspondence between college-level skills and specific occupations is also quite loose. Many occupations include workers with varying amounts of skill and education. Typically, a high-skill occupation is defined as one in which 50 percent or more of workers have a bachelor’s degree; this allows for many workers who have not gone beyond high school to be working in occupations that are considered high-skilled. More in-depth studies find that occupations do not map well to skills: less than 10 percent of the variance in skill requirements is explained by occupation and, within each occupation, skill differences matter in explaining wages. A significant amount of wage inequality exists within occupations rather than between occupations; choosing a

specific occupation matters, but so does the worker's position within that occupation.

Perhaps the distinction between career and technical education and academic instruction is simply defined by the level of education required to do the related jobs. "CTE jobs" are those that require less than a bachelor's degree, while those that require at least a four-year degree are considered "academic jobs." Education in a four-year college that is explicitly for job preparation, such as for teaching, is not referred to as CTE. This distinction seems unnecessary: it is not clear why jobs requiring a lower level of education require a special title and a special (albeit modest) legislative agenda. It also ignores the many associate's degrees in general studies or liberal arts.

In any case, the concept of "jobs that require a bachelor's degree" is not well-defined. Up to 50 percent of workers in a high-skilled job might not have a bachelor's degree. Indeed, community colleges provide effective workers for almost every industry and occupation. In nearly every industry, persons with "some college," and many with associate's degrees, represent 30 to 40 percent of all workers (unweighted by employment size). There are some industries in which most of the workers are not college-educated (such as food preparation) and there are others in which most workers have four-year degrees or above (such as the judiciary). But there are almost no industries in which persons with some college predominate; instead, these workers are spread across the economy. The same spread is evident for occupations. Some occupations are closed off to associate's degree holders: lawyers and judges, physicians and surgeons, and teachers (these are occupations in which fewer than 10 percent of workers have only some college). Occupations in which associate's degree holders predominate are mostly in nursing and health care. Thus, associate's degree holders cannot be surgeons, but they can work in occupations that complement surgeons' work. This pattern holds true for most occupations across the economy.

Similarly, direct analyses of tasks do not provide a clear link to CTE programs. Most economists agree that routine tasks are disappearing, leaving workers to perform mostly manual, nonroutine, and cognitive skills. Yet, despite widespread computerization, some studies find the task mixture of jobs to be largely unchanged over the last two decades. College graduates do perform significantly more complex tasks than high school graduates (less time spent on repetitive/physical tasks and more time on management, problem-solving, and math). However, this task-based information is very general. It is difficult to design a college program around "complex tasks," "problem-solving," or "abstract tasks"; it is even harder to distinguish such a program as vocational.⁵

Finally, tasks and skills are dynamic. Workers have a range of skills that they can apply as the returns to each task change; firms can change the allocation of tasks or task composition of jobs in response to workers' skills. This suggests that whatever the skills defined for jobs at the point of hiring, employers may make use of higher-level skills, especially general academic skills, after someone is hired. Moreover, workers with social/general skills may be more adaptable, particularly if a team of workers is allocated multiple tasks and must work collaboratively.

Indeed, it is possible to erode the distinction even further. The notion that academic skills taught in liberal arts programs are not work-related has little support. Advocates of occupational education argue that a general academic education does not explicitly teach students valuable labor market skills. But this is not proven and certainly does not apply to all degree programs. Many teachers and professors, for example, studied academic disciplines at the undergraduate level that are of direct relevance to their employment. These academic disciplines might seem "liberal," but they actually represent early occupational training. This point was recognized by educational reformer John Dewey over a century ago:

Many a teacher and author writes and argues in behalf of a cultural and humane education against the encroachments of a specialized practical education, without recognizing that his own education, which he calls liberal, has been mainly training for his own particular calling.⁶

For many workers, academic education *is* their vocational education.

Ultimately, the debate between academic versus vocational education might be settled in the labor market. If the returns to vocational programs clearly and systematically outstrip those for academic programs, then the distinction between these programs is meaningful. Here, we briefly review evidence on the economic returns to subbaccalaureate college.⁷

In general, the returns to community college occupational programs appear to outstrip the returns to academic or general education degrees. Initially, research distinguished between awards in academic disciplines versus vocational disciplines, with many studies finding that students who took vocational programs or pursued more quantitative academic disciplines had superior labor market outcomes and even that less technically oriented courses yielded no payoff at community college. Often these studies compared college graduates to high school graduates.

More recently, a series of studies have estimated the labor market returns within community college. These studies, using individual-level data across

statewide community college systems, compared associate's degree completers with community college noncompleters.⁸ Their main conclusion was that there are robust and long-lasting returns to associate's degrees, despite some trends that appear to threaten those benefits.

Consistently, these studies find that the returns to associate's degrees are strongly positive. Given the slight differences in specifications, time periods, and cohorts, the results across the states exhibit a consensus. For each year after college, individual earnings are approximately \$4,880 higher for male and \$7,520 higher for female associate's degree holders (in 2018 dollars). With average quarterly earnings over this postcollege working period of approximately \$30,240, the gains from associate's degree completion are 18 and 26 percent, respectively. Note that this one-year average gain (of \$6,200) is close to the average debt per community college student. The studies also establish that the returns to associate's degrees persist after college exit. (Studies vary in how they model the persistence of returns, so it is not easy to provide a summary value for persistence of earnings gains.) Overall, the earnings gain for associate's degrees over noncompletion of community college appears to be high, durable, consistent, and robust.

Increasingly, studies have looked at differences in earnings across degrees in different subjects. At the community college level, the highest returns are in the health sciences, which are considered vocational programs. However, several factors offset these high returns. One is that health sciences programs are often selective, drawing more able students from the community college pool. Another is that the programs have higher drop-out rates, implying a lower prospective return to completion. And a third is that these programs often cost more than general studies degrees. Plus, students in occupational degree programs do get academic instruction. For example, students in health sciences may take a large proportion of coursework outside their department to, for example, satisfy humanities requirements or complete related business, math, and computing coursework.

Some academic or general education programs in community colleges are poorly organized or nebulous, sometimes serving as default programs for students who do not have a clear idea about what they want to do after college. But when the programs are more systematically developed, they are designed to prepare students to transfer, serving as the first two years of a four-year degree in which the more occupationally focused instruction would take place at the destination transfer institution.

Broadly, associate's degrees in vocational fields yield higher returns than those in academic fields. However, the average returns overall are still positive and a large proportion (more than 40 percent) of these degrees are Associate's

of Arts (not Sciences or Applied Sciences). So, associate's degrees in general yield positive returns, and gaps across disciplines may reflect unobserved differences in student characteristics, preferences, tuition prices, and program design elements related to transfer.

Often, community college students are faced with a choice between an associate's degree and a certificate, a choice that has received more attention lately as some policy-makers and researchers have emphasized the benefits of certificates. Degrees may have both academic and vocational content, while certificates are much more focused on specific occupational content. Again, using transcript-level data in analyses that account for individual workers' characteristics, recent studies have looked at the labor market returns to certificates and have found that, across the statewide analyses, returns are positive but modest. On average, the returns to male certificate holders are \$530 and \$740 to female certificate holders per quarter; this equates to \$2,120 and \$2,960, respectively, per annum. However, some studies find returns that are negative and others find returns that are not statistically significant, with estimates varying widely across states. Notably, different types of certificates have different returns, although broadly, certificates that require more credits generate greater labor market gains. Overall, returns to certificates are positive but temporary, and not robust across economic conditions, post-secondary contexts, or across econometric specifications. Certainly, these certificate programs are shorter, and their graduation rates are higher than for associate's degrees. But, given they only yield a temporary boost in earnings, it is far from obvious that community college students should earn CTE-based certificates and not associate's degrees that have a stronger academic component.

Students on the margin of enrollment may not experience the same returns. They may have lower interest or aptitude for college or may have higher opportunity costs. However, a significant number of students may face exogenous constraints or information constraints that hinder enrollment. These students may be expected to have returns close to the average: the reason they do not enroll has little to do with their ability to benefit. Indeed, many community college programs are open access, and students often register for courses immediately before classes start (rather than preparing for college in the last year of high school). Broadly, studies that have focused on marginal students have found returns that are either equivalent or only slightly lower than the average across all students.

Of course, just because the benefits of academic instruction have been high for the past half-century, there is no guarantee that the returns will be high over the next half-century.

While researchers and policy-makers have been discussing the tension between CTE and academic skills, labor market analysts have also been concerned about the employment implications of rapid technological change. This has already decimated the need for unskilled manual labor, and some analysts predict that jobs typically held by college-educated workers will be next, suggesting that even the academic skills learned by college graduates and that employers now say they want will not be adequate to protect graduates from advanced automation and robotization.

This fear is exaggerated. Fundamentally, increased capital increases labor productivity, which is the primary determinant of earnings and economic growth. In prior decades, this capital used to be physical (machines, automobiles); since the 1980s, it is increasingly computerized or robotized. More complex capital could replace some college-educated workers, but this replacement will not be economy-wide. Instead, it will apply only in the sectors in which robots are substitutes for workers. In other sectors, economic growth will accelerate employment: these include sectors that invent robots (like Silicon Valley) and those that use robots (such as ATMs or 3D printers) as new inputs in the production process. Moreover, if robots were eliminating many jobs, we would expect to see rapid productivity growth, when in reality, by historical standards, recent productivity growth has been slow.

Finally, the significant disruptive effects on employment generated by technology, if they do take place, would increase the importance of worker adaptability and flexibility, traits that are more likely to be learned in a curriculum that combines academic and occupational instruction rather than one focused more narrowly on job-related skills.

Associate's degrees are valuable degrees, at least on average. This conclusion holds as well for students on the margin. And we predict that this conclusion will hold up even with future trends that appear to threaten these benefits. By contrast, short-term credentials such as certificates have lower and more uncertain returns, and labor market threats to these returns appear salient.

Finally, the CTE versus academic distinction is a misreading of what students want to do. CTE programs are sometimes referred to as workforce development efforts: there is an implication in the use of the words "career" or "vocational" versus "academic" that vocational students are preparing for work and academic students are pursuing education. But this work-education distinction is hard to find: where are the academic students uninterested in employment? To be sure, education has value beyond effects on labor market prospects, but almost all community college students, as well as the vast majority of students in four-year colleges and graduate school, are expecting that their education will lead to higher paying or at least more fulfilling jobs. Even

the majority of four-year degrees are in occupational areas, such as business and health, and graduate schools are profoundly “vocational” in the sense that their programs very explicitly prepare students for work. Moreover, the broader goals of education, such as citizenship and cultural learning, apply to CTE students as well, as can be seen from the skills listed above by Advance CTE.

So, what is left? Both academic and CTE students are expected to learn general skills that cut across specific occupations, and almost all are receiving specific occupational training either in CTE programs, in liberal arts programs that are occupational training for some fields (à la Dewey), in four-year occupational programs, or in graduate school. And the vast majority of these students are hoping to use their education to improve their employment prospects.

Thus, we reject the CTE-academic distinction. It appears to be based on a misconception of the relationship between education and work, and the nature of skills and how they are taught. Notably, it masks the optimal educational path through high school and college for most students.

A typical educational path involves a stage of academic or liberal arts education followed by a stage of specific occupational education. This is true whether the student is earning an associate’s degree or some other form of subbaccalaureate award, a bachelor’s degree, or a Ph.D. Indeed, admission to many professional graduate schools, for example in education, law, business, medicine, policy, and social work, does not require a specific undergraduate major, although some particular courses may be required. Even within the social sciences there is some flexibility, once again, with some course requirements. By contrast, short occupational awards such as certificates may lack the flexibility to provide meaningful general skills, especially if they are treated as stand-alone “fixes” to skills shortages.

This emphasis on vocational education – as distinct from academic education – reflects a misunderstanding of how students should accumulate skills in college. Specifically, we argue for a Gen-Tech framework: college education should be considered as a progression from academic to vocational. Students should accumulate academic education and then, in the years immediately prior to entry to the labor market, should focus on vocational education that aligns most closely with the immediate needs of their intended job. Indeed, students should get as much academic education as they can, conditional on their need to enter the labor market at some future point. Occupationally focused programs, whether at the community college or graduate school level, should be defined primarily as conduits to the labor market, conditional on how much academic education students have had and how rapidly the

student needs to enter the workforce. This progression is desirable for two reasons. One, if the labor market changes rapidly, then occupationally specific skills need to be acquired in a timely fashion. Two, academic education conveys important skills that cannot be fostered immediately. Another important corollary is that many students who have never enrolled in explicit vocational programs should consider their final years of academic education as their version of vocational education.

The sequential mode highlights the entire student pathway. Students need to be thinking about their goals as they accumulate education. Career guidance and exploration is typically emphasized in CTE programs, but all students should have a structured opportunity to think about their future and its educational implications in high school and early in their college careers.⁹

In important respects, community colleges anticipated this message. In the 1990s, many occupational programs in community colleges were designed to prepare students for work immediately and were not transferable to a four-year institution. But, as the workforce became more highly educated and as employers shifted toward workers with bachelor's degrees rather than associate's degrees, college leaders perceived that students should at least have the option of transferring to acquire a bachelor's degree. This led to several changes, most notably the merger of state technical college systems that granted certificates or nontransferable associate's degrees with comprehensive community college systems that included many transferable programs. Colleges also placed new emphasis on transfer for both technical colleges and comprehensive community colleges.

We emphasize this sequential model primarily to highlight that this is not a process unique to any level of education for work. All students need the general education typically referred to as academic, but most students also get more specific occupational preparation. But we are not arguing for a rigid application of the sequential nature of the preparation for work, or for vocational education independently to address the skills needed for success in the labor market.

There are two circumstances in which general and more specific work preparation can be combined. Indeed, many educators advocate for the use of contextualized general instruction. This is an approach through which the student's vocational interests are used to motivate their learning of academic or general skills. Thus, there is a place for specific work preparation skills in high school or community college. Moreover, we do not advocate a sharp transition. For example, as students proceed through college and approach more serious thinking about employment, internships become an attractive option for not only teaching specific skills, but perhaps more important, for

teaching general workplace skills. In his inaugural speech in September 2018, the president of Harvard expressed his hope that all Harvard students would have an internship experience. The majority of community college students already work, but their jobs are often unrelated to their studies. Connecting community college students with internships or part-time positions in their field of study could be of great benefit.

The concept of stackable credentials is another phenomenon that challenges the sequential Gen-Tech model. Students who may not be able to study for two or three years might want to earn a certificate and spend some time working, but with the ability to return to college to earn a higher degree without losing the credits that they had already earned. Yet, although there is considerable discussion of stackable credentials, their prevalence is very low: at most, 5 percent of the college-educated population have credentials that might generously be described as stacked. Short-term certificates seem to be more common for older workers or those who already have college degrees and are looking for a job upgrade.

The primary conclusion from our argument is that there should be no meaningful and robust distinction between occupational or CTE and academic programs for students. Any attempts to make a sharp distinction do not stand up to scrutiny. All students need a solid foundation of general skills, and all students need some instruction in particular jobs or occupations that they aspire to. The baccalaureate-subbaccalaureate distinction has been used as one possible way to differentiate CTE from other types of programs, but that is at best a vague and shifting demarcation. No one wants to make an explicit distinction between people who work with their hands and those who do not, although it might be fair to say that that distinction lurks in the background. Related, low-income students and students of color are disproportionately enrolled in CTE programs, and educators have struggled for years to convince these students that they will get good jobs. Consigning students to a CTE track may be creating undesirable social stratification.

The general sequential model highlights that, in most cases, students build occupationally specific learning on a foundation of general skills. But small amounts of occupational instruction without a general foundation, as students typically experience in a certificate program, too often lead to uncertain and short-term wage increases. At the same time, more or less unorganized general education of the type that many students get if they only take a general studies associate's degree may also have minimal value; instead, associate's degrees that have general skills and some vocational application are valuable, even as there is considerable variation among different fields. In

short, students will prosper most if, after a strong academic education, they are able to complete a vocational program with direct relevance to their intended work. Short vocational programs or ill-structured academic programs are less desirable.

It is a puzzle why the vocational-academic distinction remains so strong. Perhaps the renewed Perkins Act provides an institutional foundation to the continuation of the distinction. Perkins provides additional federal funding to the states, and perhaps that makes the distinction worth preserving. But Perkins is funded at \$1.7 billion annually in both secondary and postsecondary education, while annual public spending on higher education is over \$355 billion, and students and their families pay a total of \$560 billion on private and public colleges. The ratios speak for themselves.

Our education system needs to provide a variety of educational pathways. All students should receive help in choosing those pathways and well-organized programs that teach the variety of skills they need to be successful workers, as well as citizens. Some programs will take longer than others, but whatever the length, they share an underlying foundation and structure. We should make sure that every one of those pathways is successful, rather than seeking to differentiate students into categories that carry fraught implications.

ABOUT THE AUTHORS

Thomas R. Bailey is President of Teachers College, Columbia University, where he is also the George and Abby O'Neill Professor of Economics and Education, Director of the Community College Research Center, and Director of the Center for the Analysis of Postsecondary Readiness. He is the author of *Re-designing America's Community Colleges: A Clearer Path to Student Success* (with Shanna Jaggars and Davis Jenkins, 2015), *Working Knowledge: Work-Based Learning and Education Reform* (with Katherine L. Hughes and David Moore, 2004), and *Manufacturing Advantage: Why High-Performance Work Systems Pay Off* (with Eileen Appelbaum, Peter Berg, and Arne L. Kalleberg, 2000).

Clive R. Belfield is Professor of Economics at Queens College, City University of New York; and Principal Economist at the Center for Benefit-Cost Studies in Education at Teachers College, Columbia University. He is the author of *Economic Evaluation in Education: Cost-Effectiveness and Benefit-Cost Analysis* (with Henry M. Levin, Patrick J. McEwan, A. Brooks Bowden, and Robert D. Shand, 3rd ed., 2017), *Privatizing Education Choice: Consequences for Parents, Schools, and Public Policy* (with Henry M. Levin, 2005), and *Economic Principles for Education: Theory and Evidence* (2003).

ENDNOTES

- ¹ Kern Alexander, Richard G. Salmon, and F. King Alexander, *Financing Public Schools: Theory, Policy, and Practice* (New York: Routledge, 2015).
- ² Advance CTE, “Who We Are,” <https://careertech.org/who-we-are>.
- ³ Advance CTE, “The Career Ready Practices,” <https://careertech.org/career-ready-practices>.
- ⁴ David Deming and Lisa Kahn, “Skill Requirements across Firms and Labor Markets: Evidence from Job Postings for Professionals,” NBER Working Paper No. 23328 (Cambridge, Mass.: National Bureau of Economic Research, 2017).
- ⁵ For a full discussion of these issues, see Clive R. Belfield and Thomas R. Bailey, “The Labor Market Value of Higher Education: Now and in the Future,” in *Higher Education: Handbook of Theory and Research*, vol. 34, ed. Michael B. Paulsen and Laura W. Perna (Basel: Springer Nature, 2019).
- ⁶ John Dewey, *Democracy and Education: An Introduction to the Philosophy of Education* (New York: The Free Press, 1944 [1916]), 313.
- ⁷ For evidence on these estimates, see Belfield and Bailey, “The Labor Market Value of Higher Education.”
- ⁸ Most of these studies apply Ordinary Least Squares or Fixed Effects (FE) regression models of earnings against highest level of attainment, controlling for work experience and other covariates. Often referred to as the returns from college, this coefficient captures the gross returns; it does not account for the cost of college. These approaches have two main problems. First, they only yield an unbiased estimate of the gains from college if all other variables that are correlated with education and that determine earnings are included: for instance, if there is no “omitted variable bias” (such as from ability). Second, these approaches do not account for the endogeneity of college enrollment: only students who think they will obtain high earnings do in fact enroll in college. However, these biases are not large and appear smaller for more recent studies that use FE models.
- ⁹ Applying a similar framework, Derek Neal summarizes such a pathway as “learn to learn,” “learn to earn,” then “earn.” See Derek Neal, *Information, Incentives, and Education Policy* (Cambridge, Mass.: Harvard University Press, 2018).