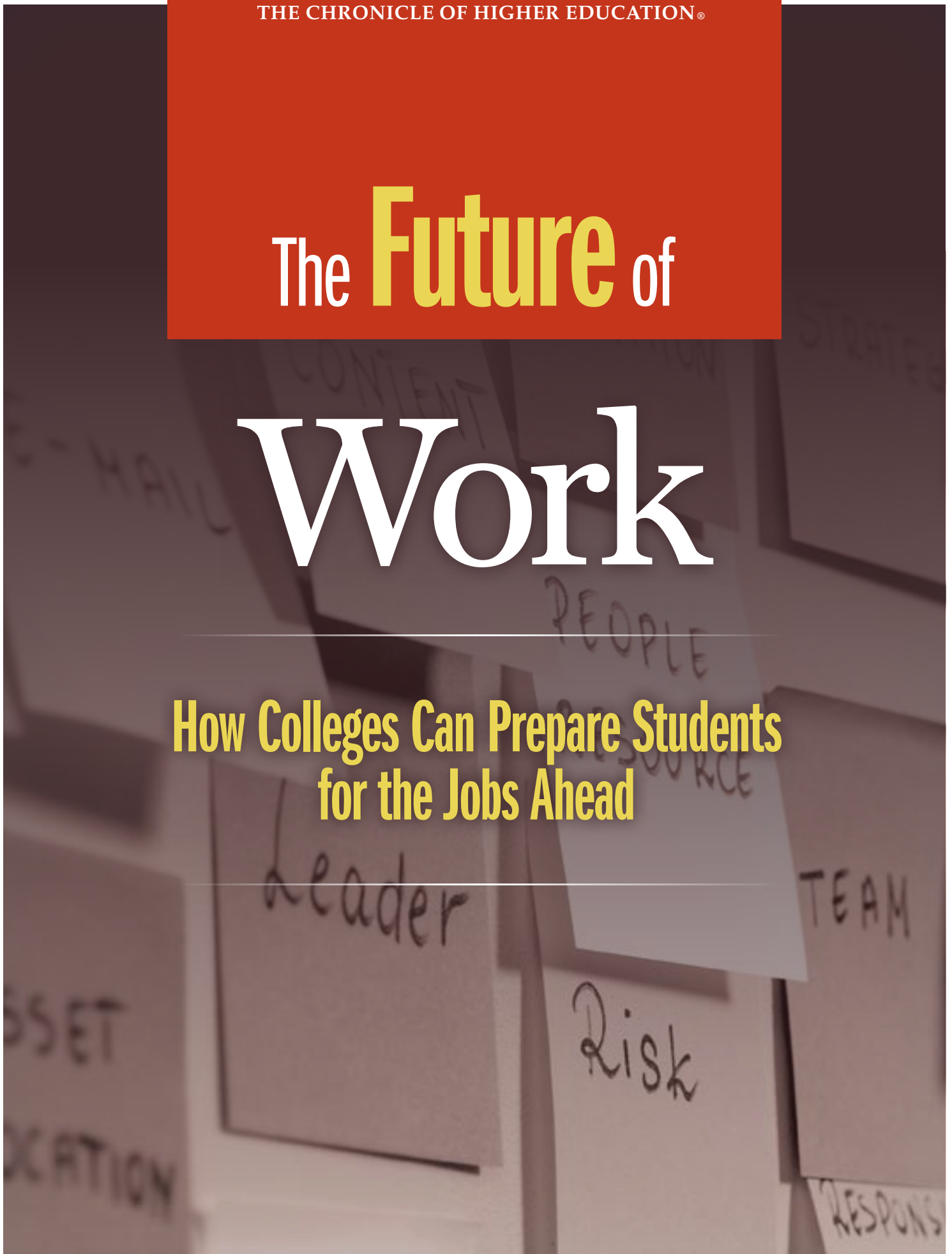


THE CHRONICLE OF HIGHER EDUCATION®

The **Future** of

Work

**How Colleges Can Prepare Students
for the Jobs Ahead**



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About the Author



Scott Carlson joined *The Chronicle of Higher Education* in 1999. Since then, he has written about a range of issues: college management and finance, the cost and value of higher education, buildings, campus planning, energy, architecture, sustainability, and inequality. He was the founder and host of *The Chronicle's* popular Tech Therapy podcast, and he has also been a contributor to *The Chronicle Review*, writing about Marxist scholars, resilience, practical skills in education, and more. He has won awards from the Education Writers Association, and has been a frequent speaker at colleges and conferences across the country.

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This report gathers some of the latest information about the future of work and colleges' connections to it, laid out in four sections:

Section 1 Jobs of the Future



The Bureau of Labor Statistics and labor economists see science, technology, engineering, and healthcare fields growing rapidly, while employment in manufacturing will decline. As the economy continues to migrate toward service jobs, soft skills will be important to success, and the liberal arts are often touted as a means of delivering those skills. However, analysts note that liberal-arts degrees will be much more marketable with the addition of hard technical skills, like coding. Automation is a wild card: Economists and computer scientists are still not sure how vast the impact of robots and artificial intelligence will be — whether it will put many people out of work, or create more wealth and jobs.

Section 2 Voices of Employers



Employers may have an expanded role in helping institutions train students for employment after college. That role depends, to some extent, on the ability of employers and colleges to form partnerships. The employers also have an advantage in such partnerships, as they may provide an opportunity for companies to identify and hire the highest-performing students. Often, the skills that employers are looking for are not conveyed in a college transcript: the ability to communicate, lead, bounce back from failure, and empathize with different people.

Section 3

The Future of Career Centers



Career centers were once merely a department on campus that put on job fairs and reviewed résumés for students. In the future, they will have to evolve and scale up — often using technology — to serve more students, at a time when the resources for career centers at many colleges are stagnant or in decline. This section looks at career centers at three colleges: Bentley University, where career-center employees are intensely focused on employers and outcomes; Colgate University, where the career center is using alumni to open doors for students and raise money for job programs; and Colorado State University, where the center’s director insists that the work of the career center needs to be integrated into the rest of what the university does.

Section 4

A Conversation with Philip Gardner



Mr. Gardner, a longtime leading scholar of the path from college to work, says that the world of work will be much more chaotic in the future, and students should be trained to deal with the uncertainties that brings. The future will require colleges to give students depth in disciplines and breadth in their ability to work across specialties — a model he advocates in so-called T-shaped professionals. There are also opportunities for colleges to capitalize on retraining people who have been displaced in the job market, but instead of degrees, colleges will need to offer training in packages that are smaller, faster, and more relevant.

R

aihaan Darr should stand as a cautionary tale for colleges and universities today.

I met Mr. Darr in North Carolina in late 2016, when I hailed a Lyft at a conference. While driving across town, Mr. Darr explained that he had recently graduated from a private college in Missouri with a degree in finance. But he was picking up random people for Lyft because he was having trouble finding a job. All of the companies where he had applied asked for experience, certifications, and other qualifications, and he had not gotten any of that in college.

I took down his number, and checked in with him months later. He had found a job in the accounts-payable department in the corporate office of a big-box retailer. The job paid \$17 an hour. But the company had recently cut positions and increased his workload, and to add to that, he was feeling the pressure of his student-loan bill, at nearly \$450 a month, along with all the other bills he needed to cover.

He noted that neither the college in Missouri nor the two community colleges he attended to get his associate degree made much effort to advertise their career services.

“For internships,” he said, “there was nothing but a little board on the wall with jobs posted, but these were jobs in the local community — boxing things up or packing, labor types of jobs. There was nothing for an internship if you wanted to go into accounting or if you wanted to do business management. If you did not seek the information for internships and career paths and plans, it wasn’t marketed.”

He now looks back on his time in college — even at the institution itself — with regrets.

“I am bitter about my schooling experience,” he said. “I am bitter about the fact that I have wasted so much time.” He marvels at the notion that a teenager with charisma, a YouTube account, and a schtick can set up a camera in her room and make more than he and

many other college graduates do. “You start to realize that the social skills are so much more important. There are people going to school getting degrees now that might not be relevant in four years. The world is changing so fast.”

Mr. Darr’s story is one that should haunt college administrators because, at some level, it represents a betrayal of a common view of college as a vehicle to employment. As Mr. Darr himself puts it: “What’s beat into our brains is that you have to go to school to get a job. What’s not beat into our brains is that you kind of have to know what you want to do” — and how to navigate a path forward.

If colleges want to maintain the goodwill of their students, parents, policy makers, and the public at large, institutions must do more to help figure out what students can do with their degrees and how they can go about doing it. Simply handing a graduate a diploma and an alumni card was really never good enough, but with the rising cost of college and increas-

ing expectations for the usefulness of a degree, higher education must embrace its role as a gateway to the workforce.

Some would bristle at the suggestion of that role. College, after all, is about opening one's eyes to the world, about self-discovery and the big questions. And higher education's advocates and defenders frequently laud the long-term advantages of a college degree, with the various personal and societal benefits it confers. Graduates are more likely to be involved in community, religious, and civic life, and they are more likely to be leaders of organizations in their communities. They are less likely to commit crimes. They are less likely to smoke, their health is generally better than non-college graduates, and their life expectancy is longer. They report being happier, and they are more likely to be married, and less likely to get divorced.

Is it the college education itself that led to all those better statistics? Many are deeply entwined with social class, health insurance, and income. And all of those factors are linked to a good job. For decades, even colleges themselves have pushed that employment argument. In the 1970s, historians have noted, college leaders developed a pitch for state legislatures: Higher education boosts the economy, and it's a benefit for people who want to take their places in that economy.

That connection between academe and a return on investment has taken root, and it is now also supported by salary data: In the last 40 years, the wage premium associated with a four-year college degree has doubled. But that wage premium exists not because jobs requiring a four-year degree pay more — those wages, overall, have remained flat. The wage premium exists because the pay for low-skill jobs has gone down.

The cost of college has also roughly tripled, when adjusted for inflation, since the 1970s. According to the College Board, average tuition, fees, room, and board at a four-year public college comes in at around \$20,000 a year. At a private college, that bill runs over \$45,000.

So the calculation made by students and their parents is simple: You need a college degree to make a decent living, and the cost of that degree is higher than ever. While higher

education's defenders highlight the long-term benefits of college, it's understandable that students and parents focus on short-term earning power.

Colleges ignore that calculation at their peril.

What's more, the world of work is becom-

“It used to be that you got a good education from a good school and you had a good internship. You'd start your career and, with a little bit of bobbing and weaving, you'd be successful.”

ing much more unpredictable and unstable, with major disrupting forces (like technology and automation) on the horizon. Colleges — particularly those that specialize in liberal arts — have long said that they prepare students for not just the first job, but the many different ones that may follow. In the decades to come, that adage will be more true than it has ever been.

“It used to be that you got a good education from a good school and you had a good internship. You'd start your career and, with a little bit of bobbing and weaving, you'd be successful,” says Michael Sciola, the associate vice president of institutional advancement and career initiatives at Colgate University. “That's gone. In this new workplace, students must have a fundamental understanding of what it means to manage their own career, with intention and with impact. They are going to have to create opportunities for themselves going forward.”

SECTION 1



Robin Beckham/Alamy

Jobs of the Future

The story of employment in the United States over the past 100 years has also been a story of American education. The nation spent the past century raising the rates of high-school graduation, which gave people opportunities to do more complex and higher-paying jobs, and the rates of college attainment have followed: In 1940, just 5 percent of the U.S. population had a bachelor's degree; today, more than one in four people have a bachelor's degree, and many more have earned two-year degrees, certificates, and other forms of postsecondary training.

As education levels have risen over those decades, Americans have seen the world of work transform from one driven by manufacturing and men, focused on discrete tasks, to one increasingly dominated by services, technology, and complex human interactions, with a growing number of women in the workforce. The project for the future will be to increase

the number of people who get postsecondary degrees — in large part because the job market demands it: Those service jobs and other emerging forms of employment require people to have deep knowledge within a discipline, but also the ability to converse with people from other kinds of professions, ethnicities, and cultural backgrounds. The health and growth of economies, scholars have shown, is tied to education levels. The United States has maximized the returns it can get from high-school graduation rates, which have hit an all-time high at 82 percent. The future for the American economy today — and the jobs that will drive it — is inextricably tied to higher education.

The future of work, however, is uncertain, even for economists who study the labor market. But many of them see these trends continuing into the future, with various challenges emerging for the average working American: While science, technology, engineering, and healthcare fields will continue to grow rapidly, more jobs will require recent college graduates to more fully merge their training in hard skills with soft skills. At the same time, employment may become more tenuous,

as computers and robots reinvent and even eliminate some kinds of jobs, while other jobs become freelance and part-time “gigs.”

The Outlook

By 2024, there could be a total of 160 million jobs in the United States, up from around 150 million jobs tallied in 2014, according to an analysis of the latest data from the Bureau of Labor Statistics by the Georgetown Center for Education and the Workforce. The center estimates that in those 10 years, employers will have had 56 million job openings because of growth or replacement needs in the labor market. About 20 million of those openings will be available to people who have high school degrees or less. The remaining 36 million will require at least some college or postsecondary degrees of various kinds. (Figure 1.1.)

Almost all the categories listed will see some kind of growth, with some seeing double-digit gains. Only manufacturing, farming, fishing, forestry, and similar occupations could see negative job growth, as they have been in decline for decades. In the 1970s, manufacturing represented about 40 percent of all jobs in America; today, it represents one in 10.

The industries and occupations in which a majority of the workers have some kind of postsecondary training — whether it’s certificates or degrees — are growing the fastest, says Nicole Smith, an economist with the Georgetown center. Occupations that don’t require postsecondary education are in decline. And the fastest-growing occupations also reflect the demographics of the aging baby

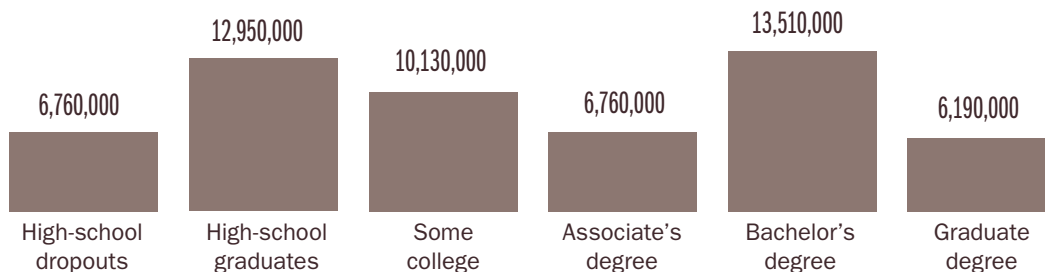
“The population is aging and not very healthy, so occupations that help people get around and recover will continue to grow.”

boomers. Jobs in healthcare and personal care will be expanding dramatically. (Figure 1.2)

“The population is aging and not very healthy, so occupations that help people get around and recover will continue to grow,” Ms. Smith says. Many of those fast-growing jobs do not require four-year degrees. For example, the fastest-growing category among all jobs is healthcare-support occupations. “The problem with healthcare-support occupations is that they tend to be low-education positions,” Ms. Smith says. “They are easy to get into, and you can train for a short period of time, but the wages are low and they are not developed pathways. They tend to be dead-end jobs.” Healthcare-support occupations include jobs like home-health aides (which will see a 38 percent increase), occupational therapists (up 40 percent), and phlebotomists (up 25 percent).

Healthcare practitioners and technical

1.1: EDUCATION LEVEL NEEDED FOR PROJECTED JOB OPENINGS, 2024



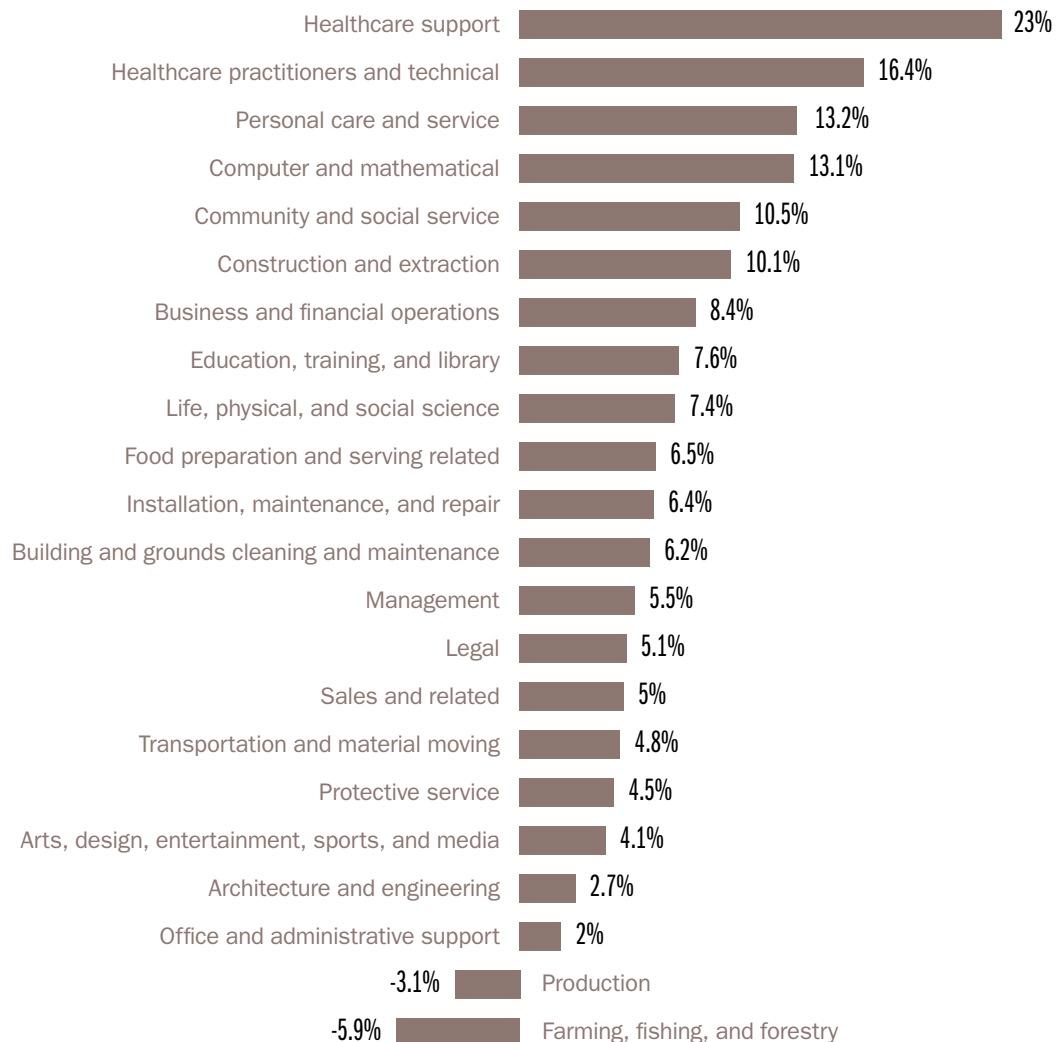
SOURCE: Georgetown University Center on Education and the Workforce analysis of U.S. Bureau of Labor Statistics data

occupations, which will see growth of 16.4 percent, tend to include jobs with higher levels of training. It's a category that represents many more jobs, because it includes the nation's three million nurses, an occupation that may grow by 35 percent by 2024. Nurse midwives could grow by 24.6 percent and physician assistants by 30 percent. Ms. Smith says some of that growth has been driven by the Affordable Care Act: "Its cost-saving initiatives tried to take the roles away from doctors and push them down to nurses." Although efforts

to repeal and replace Obamacare recently died in Congress, Republicans have vowed to continue putting pressure on that program. It's unclear how that pressure might affect those numbers.

The growth or decline of some jobs are tied to predictions about the economy and the wealth of Americans. A number of jobs in personal care and service occupations — a category that includes manicurists, fitness trainers, animal-care workers, and so on — are expected to see healthy growth: Hairdress-

1.2: PROJECTED PERCENTAGE CHANGE IN EMPLOYMENT BY MAJOR OCCUPATIONAL GROUP, 2014-2024



SOURCE: U.S. Bureau of Labor Statistics

ers, for example, will be up 13 percent. Personal-care aides — people who handle everyday tasks for wealthy clients, like shopping or decorating — could be up 26 percent. Meanwhile, fast-food cooks are expected to decline by nearly 16 percent, and Ms. Smith guesses that this reflects fast food’s status as an “inferior good.” The economists behind the numbers may be predicting that Americans will have

more money, and will opt to spend it on steaks rather than Big Macs. It could also be tied to automated processes in fast-food kitchens that require fewer people.

An overall pattern comes out in the numbers: Jobs that feature skills that require complex human interactions will remain in demand. Customer-service representatives will see a whopping 253 percent growth, for

1.3: OCCUPATIONS WITH HIGH PROJECTED GROWTH, 2014-2024

FASTEST GROWING

	Percent change, 2014-2024	Median annual wage, 2015
Wind turbine service technicians	108%	\$51,050
Occupational therapy assistants	42.7%	\$57,870
Physical therapist assistants	40.6%	\$55,170
Physical therapist aides	39.0%	\$25,120
Home health aides	38.1%	\$21,920
Commercial divers	36.9%	\$50,470
Nurse practitioners	35.2%	\$98,190
Physical therapists	34.0%	\$84,020
Statisticians	33.8%	\$80,110
Ambulance drivers and attendants, except emergency medical technicians	33%	\$23,740

LARGEST JOB GROWTH

	Number of new jobs, 2014-2024	Median annual wage, 2015
Personal care aides	458,100	\$20,980
Registered nurses	439,300	\$67,490
Home health aides	348,400	\$21,920
Combined food preparation and serving workers, including fast food	343,500	\$18,910
Retail salespersons	314,200	\$21,780
Nursing assistants	262,000	\$25,710
Customer service representatives	252,900	\$31,720
Cooks, restaurant	158,900	\$23,100
General and operations managers	151,100	\$97,730
Construction laborers	147,400	\$31,910

SOURCE: U.S. Bureau of Labor Statistics

example. The college graduates who fill these kinds of jobs will need to be able to think on their feet, communicate clearly, identify complex problems, and solve them.

Hard and Soft Skills Needed: the Liberal Arts and STEM

Supporters of the liberal arts often argue that the humanities, sciences, and social sciences give college students broad exposure to different cultures and disciplines, and that the inherent ambiguities within those disciplines train those students in critical thinking, civic knowledge, teamwork, empathy, and other qualities that many employers say they value today — and will become even more necessary in the future.

In the past several years, the Association of American Colleges & Universities, which advocates for liberal education, has released several reports and surveys showing that employers value these “essential learning outcomes” that can prepare students for the wide range of jobs they might hold in their lifetimes. Some of those surveys have shown that 40 percent of recent graduates hold jobs that are not closely related to their college major.

Two years ago, the World Economic Forum released a report with its very title calling for a “New Vision for Education.” The report identified 16 “21st-century skills” that employers will require. Six of those skills were literacies, often technical in nature, like financial literacy or scientific literacy. But the rest were squishier “competencies” and “character qualities,” like creativity, initiative, grit, and curiosity. Another study by Richard K. Miller, professor of mechanical engineering and president of the Olin College of Engineering, noted that “the hard science of engineering is no longer enough to meet the 21st-century challenges.” The problems that companies and societies face, he noted, range across disciplines, political boundaries, and cultures, and he called for the incorporation of “employability skills 2.0” represented in these character qualities.

Popular news media has also picked up on this theme. A celebrated article in *Forbes* in 2015 made much of the dot-com startups that were hiring right-brained theater majors and philosophy majors to bring ideas, criti-

cal thinking, and people skills to companies normally dominated by left-brained engineers and computer scientists.

Whether a liberal education actually effectively trains those so-called soft skills is a matter of faith among educators, and the outcomes depend greatly on the curriculum of any particular college, with some emphasizing those skills more than others. Outcomes also depend greatly on individual students and their backgrounds, says Doug Webber, an assistant professor of economics at Temple University who studies the labor market and its connection to higher education. Mr. Webber is skeptical of the narrative, presented in the *Forbes* article and others, that firms like Google and Slack Technologies are actively seeking liberal-arts students simply because of their majors. Yes, he acknowledges, a degree in philosophy or classics can give a student training in some of the soft skills that companies want. But Mr. Webber says the major is of secondary concern for the companies, who are looking at the candidates themselves. It’s less about the major, he believes, and more about picking the people who present well, communicate clearly, show creativity, or are well connected — traits they began developing long

1.4: PROBABILITY OF SELECT OCCUPATIONS TO BE COMPUTERIZED IN FUTURE

Occupational therapists	.35%
Healthcare social workers	.35%
Mechanical engineers	1.1%
Lawyers	3.5%
Radio and television announcers	10%
Film and video editors	31%
Heavy truck drivers	79%
Technical writers	89%
Credit analysts	98%
Telemarketers	99%

SOURCE: “The future of employment: How susceptible are jobs to computerisation?,” Carl Benedikt Freya, Michael A. Osborne

before they showed up at college.

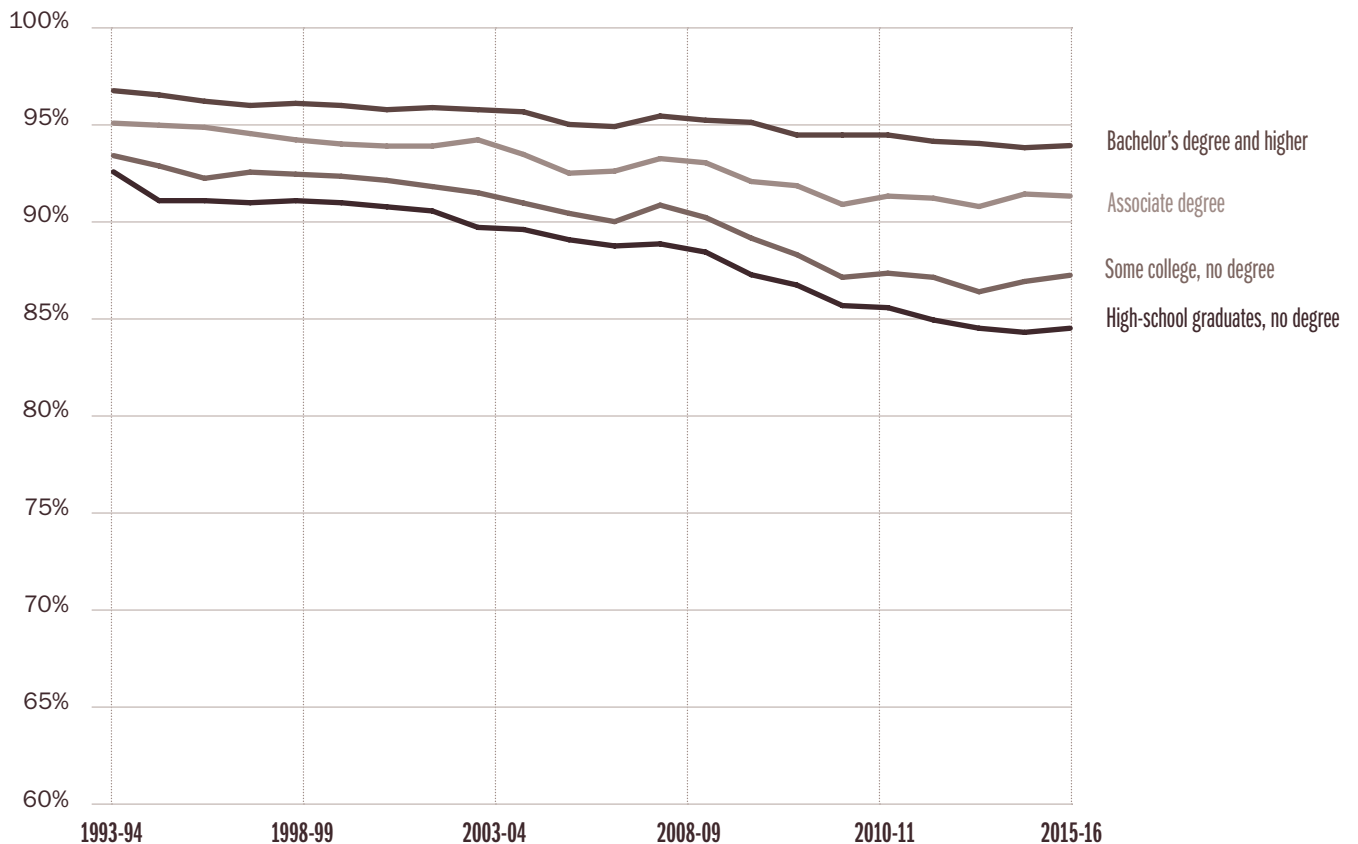
“It’s more that they are taking a really brilliant person who happened to major in philosophy, not what the major taught them,” he says. “Those people would likely succeed no matter what they majored in.”

But employers are actively seeking out graduates in science, technology, engineering, and mathematics fields, and students with that training will likely continue to be in demand in the future, even as colleges churn out more of them, Mr. Webber says. Wages have grown in those fields, even as the supply of STEM majors has increased, indicating that the market needs more graduates in those disciplines. (However, he points out, not all science majors are equal. Graduates with bachelor’s degrees in more traditional sciences, like chemistry and biology, tend to have lifetime earnings similar to graduates in fields like art history.)

But evidence suggests that the biggest wage gains will go to people who combine STEM training and technical skills with the kinds of soft skills often thought to be the hallmark of liberal-arts majors. These kinds of combinations are not obvious to students when they are picking majors, and they might not be supported by colleges that have siloed disciplines and more traditional pathways.

Classics, for example, can be a powerful frame for acquiring soft skills and setting a foundation for lifelong learning, says Matthew Sigelman, the chief executive officer of Burning Glass Technologies, a company that analyzes the labor market by collecting data on job postings. But colleges need to recognize that students in such majors will also need to learn some hard skills to take them the “last mile” toward a more advantageous position in the labor market, giving them a better shot at higher pay. Burning Glass did an analysis

1.5: LABOR-FORCE PARTICIPATION OF MEN, BY LEVEL OF EDUCATION



SOURCE: U.S. Bureau of Labor Statistics

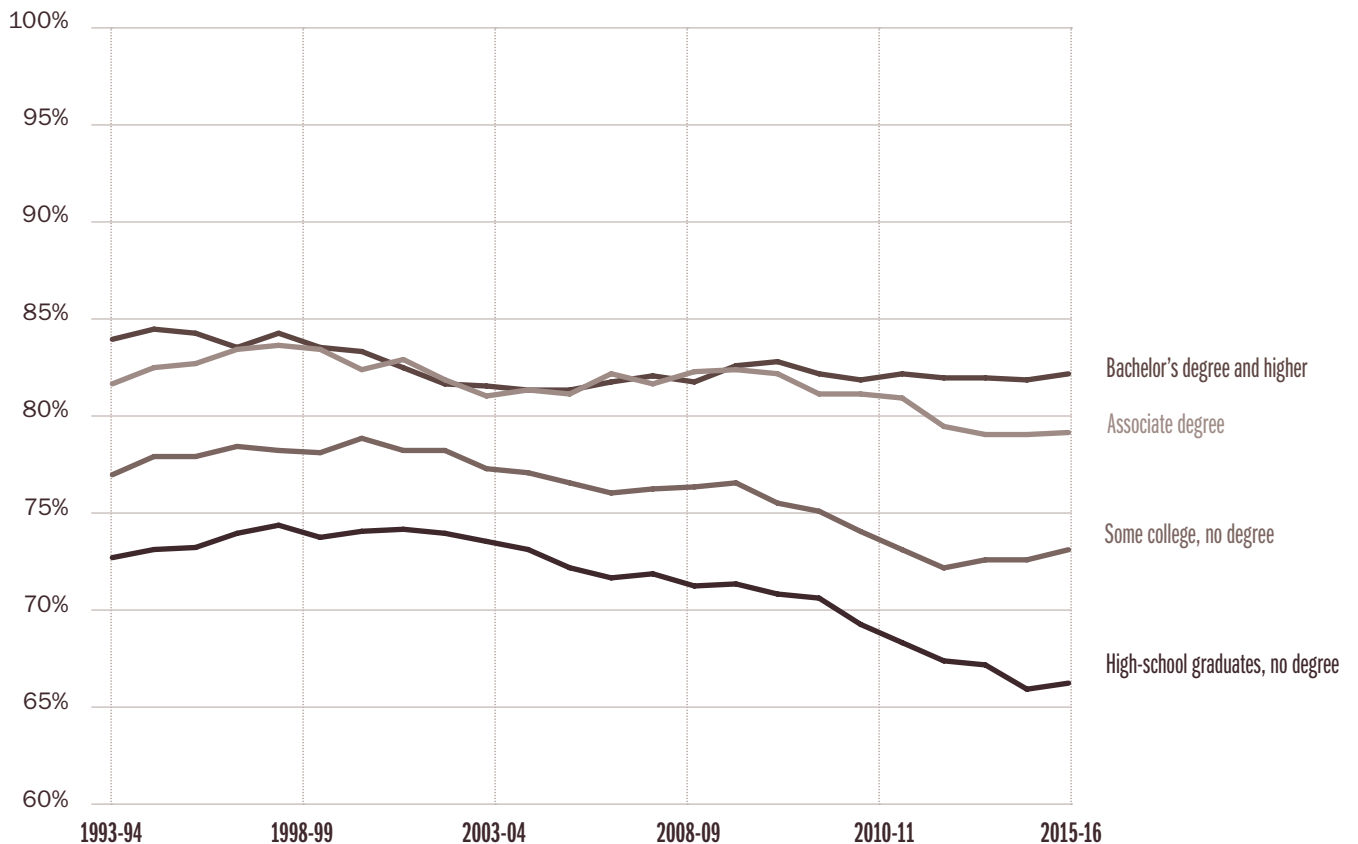
of job ads, and found about a million that did not ask for a specific set of skills and would be open to liberal-arts students. But Burning Glass found another 900,000 jobs, many with higher pay, open to liberal-arts students who added specific skills easily acquired through elective courses or technical training: basic coding, social media, web design, and so on.

The emerging trend in the labor market is more of this kind of hybridization. Take jobs in marketing, for example: Burning Glass's research indicates that positions for marketing managers close relatively quickly. But the research firm sees more employers asking for marketing managers who also have experience building databases or doing data analytics. Those positions are among the hardest to fill in marketing.

The trend runs in the other direction as well: In technical jobs — in programming or engineering — more employers are asking for

In the years to come, employers may also have to develop supply chains for talent, seeking out partnerships with higher-education institutions to cultivate the skills they need.

1.6: LABOR-FORCE PARTICIPATION OF WOMEN, BY LEVEL OF EDUCATION



SOURCE: U.S. Bureau of Labor Statistics

job candidates with experience in management or business.

People with these unusual combinations of skills — “purple squirrels,” as recruiters sometimes call them — will be able to command top pay in their respective fields. Of the jobs in the top quartile in the market, nearly half ask for some kind of coding skills, although they are not necessarily in computer science or engineering. Middle-skills jobs that are digitally intensive — incorporating coding skills — are growing twice as fast as those that aren’t, and they are twice as likely to pay a living wage.

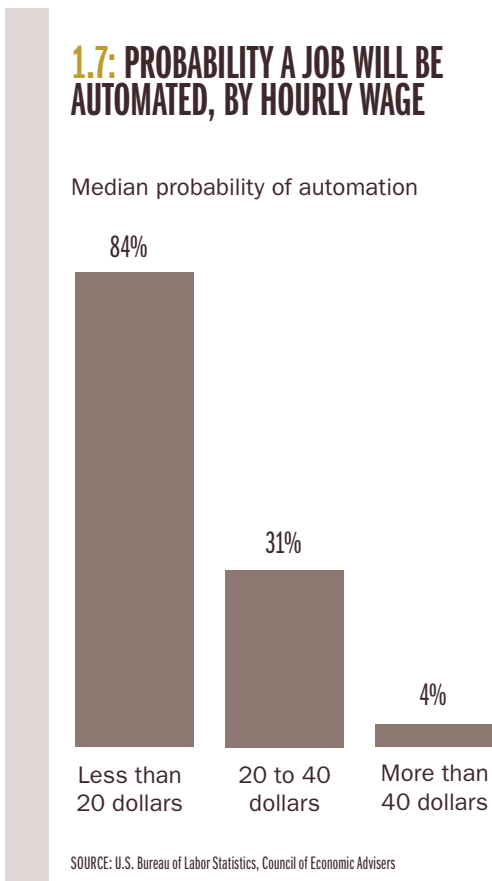
“There is real evidence that the demand for coding skills will be less in coding jobs,” Mr. Sigelman says, “but in other jobs where people will be expected to bring that skill set into their daily work.”

The problem is a disconnect between companies and job candidates: Employers have assumed that people will figure out what kinds of skills the employers need and acquire those skills to meet demand. But the workforce doesn’t necessarily understand where

the skill gaps are in the labor market. As the job market becomes more dynamic, and as employers look for increasingly unnatural combinations in skills, the most important talent will be harder and harder to find.

These trends represent a major opportunity for higher education, Mr. Sigelman says. The job market may become increasingly fluid, with skill requirements changing at an increasingly fast pace. “That dynamism in the job market suggests that no degree program can prepare students for the full array of skills that they will need in their lifetime,” he says. “There will be a tremendous business opportunity for institutions to leverage the wealth of content that they have, repackaging it in smaller bites for their graduates to help them make successful transitions to new opportunities in the job market.”

In the years to come, employers may also have to develop supply chains for talent, seeking out partnerships with higher-education institutions to cultivate the skills they need. Currently, employers and other institutions spend \$650 billion on postsecondary education and training, and \$60 billion of that on contract training. Much of that, Mr. Sigelman says, is treated merely as an employee benefit, somewhat distant from the employers’ specific needs. Employers will need to send out clearer signals for the kinds of skills that they need, and they will have to be more actively involved in job training.



Automation: The Disruptor

The 2016 presidential race galvanized a national conversation about jobs, the economy, and the people who have been left behind by forces in the global economy. Foreign workers and overseas factories took the blame during rallies for then-candidate Donald Trump. But many economists pointed out that machines, not immigrants, destroyed many of the jobs once held by Mr. Trump’s working-class base. Computers, robots, and artificial intelligence will continue to upend, eliminate, and create jobs in the years to come, in ways we may not yet fully understand.

The layperson often takes a zero-sum view of jobs and automation in the economy: When a robot takes over some task, or when a company exports a job to India or Mexico,

employment for an American is lost. Recent reports have painted dire pictures: Last year, the market-research firm Forrester said that machines would eliminate 6 percent of jobs in the United States by 2021. Oxford Martin School's Programme on the Impacts of Future Technology predicted in 2013 that 45 percent of American jobs would be threatened by computers in the next 20 years.

But economists and other scholars understand that the labor market is a complex web of interrelationships. The automated teller machine is often cited as an example: People thought ATMs would lead to the disappearance of human bank tellers. But ATMs made operating banks cheaper, so the banks opened more, smaller branches, and the number of tellers did not decline. In fact, teller jobs grew faster than average as the banks sought more personal connections with customers, relying less on their skills as money counters and more on their skills as salespeople, problem-solvers, and marketers. (However, back-office jobs in processing at banks were decimated by new technologies.)

In fact, we have been living with automation and mechanization for some time. Telephone companies once employed nearly a million people as switchboard operators to manually connect calls, but they were replaced over time by automatic switching equipment. Many offices featured secretaries who typed out documents for higher-level office workers, but word-processing software now allows office workers to type their own.

Automation often increases the productivity of the industries that adopt it, but the transitions have not been painless — and in some cases have led to broad social upheaval. Mechanization in farming, which accelerated in the mid-20th century, led to the consolidation of farms and the decimation of rural populations and small towns, even as it led to higher productivity in food production. Manufacturing has lost about five million jobs since 2000, and manufacturing towns have become emblematic of the devastation of middle America and middle-skills jobs. But output in the industry has gone up 40 percent over the past 20 years to an annual value of \$2.4 trillion, an all-time high. Compared to the output of the 1970s, U.S. manufacturing is also producing more complex products, like aerospace equipment, fabricated metals, and

electronics. Making those products might require fewer people, but those employees often need specialized postsecondary training to operate the robots and assess the items coming off the line.

"Machines don't replace people in jobs — that's not what happens," says Jerry Kaplan, a computer scientist, entrepreneur, and author

“Machines are used to perform specific tasks. And if your job consists of a series of tasks, all of which can be automated, obviously you're at risk.”

of Humans Need Not Apply: A Guide to Wealth and Work in the Age of Artificial Intelligence.

"Machines are used to perform specific tasks. And if your job consists of a series of tasks, all of which can be automated, obviously you're at risk."

Given the advances in technology, it can be difficult to predict which jobs could be replaced or altered by automation, but Mr. Kaplan offers a couple of principles as a guide: First, does the job have clear and identifiable goals and standards to know when that job is complete? Second, does the job follow a clear set of steps to complete a task?

Consider, for example, freight trucking or self-driving cars, experiments on which are already underway in the United States and Europe: The vehicles have an identifiable goal, which is getting from point A to point B. And they have a limited set of steps to complete their goals: to accelerate, slow down, stop, turn left, turn right, go forward, or go back. The big innovations in automation now center on

sensory perception, which allow machines to use cameras, microphones, and other sensors to identify and respond to objects in their immediate environment.

All of that adds up to trucking and driving as two occupations that could be performed by machines in the near future, potentially imperiling jobs for America's 3.5 million truckers. Some experts predict that self-driving trucks, cars, and drones could someday replace postal workers, delivery people, and taxis, knocking out an additional 15 million jobs.

Many experts in artificial intelligence see a future where any routine task — and perhaps some non-routine ones — are candidates for automation: accountants, clerks, telemarketers, movie projectionists, receptionists, and even pharmacists, archivists, and janitors.

Many experts in artificial intelligence see a future where any routine task — and perhaps some non-routine ones — are candidates for automation: accountants, clerks, telemarketers, movie projectionists, receptionists, and even pharmacists, archivists, and janitors. This spring, Fukoku Mutual Life Insurance, a Japanese company, replaced 34 workers in its corporate office with an artificial-intelligence system, based on IBM's Watson Explorer, that could calculate payouts to policyholders. Computers are already used to write sports and business articles for some publications, wrapping narrative around scores and market

data, and computer scientists are working on artificial intelligence that can create more complex narratives in story form, threatening the already beleaguered journalism industry. The jobs under threat are not necessarily limited by salary or social class: Machines could one day take X-rays of bodies and then learn to spot broken bones, tumors, or other anomalies in the images and diagnose them. It's not clear what happens to highly paid radiologists under that scenario.

How this shakes out in the job market — and what role higher education plays in response — is something of a debate among pessimists and optimists.

Moshe Vardi, a professor of computer science at Rice University and an expert on artificial intelligence, acknowledges that automation increases productivity and can elevate work from more rote tasks to more variable and complex jobs, often with higher pay. But in darker moments, he sees the march of technology destroying so many jobs that growth in the economy will not be able to keep up.

Automation, he points out, replaces routine jobs — and particularly, those routine jobs where it's cheaper to buy or build a machine than hire a human. In the stratified labor force, the jobs in the middle — which require some skill and command decent salaries — are most vulnerable to mechanization. If many of those jobs are eliminated, that will create an even bigger divide in society and the workforce, with the remaining jobs falling mostly into two categories: At the top will be the highly skilled, non-routine jobs, which are often paired with high salaries to match the demands and education requirements of those jobs. And remaining at the bottom will be low-skilled jobs with salaries so low that it's less expensive to hire a human than buy or build a robot to perform the tasks.

For 60 years now, the labor-force participation rate among men age 25 to 54 has been going down, from 98 percent in 1954 to 88 percent today. One in six men is not working, and they are often not counted in unemployment statistics because they have dropped out of the workforce.

"The whole arc of human history is about working and being productive," Mr. Vardi says. "What happens to humanity when you take this away? This is a huge question." Today, even conservative pundits — like Charles

Murray — propose establishing a universal basic income to support people permanently displaced by the economy. But money is only part of the equation, Mr. Vardi says. People who have nothing to do or nothing to think about may fill their lives with destructive activities, like drugs and crime. “This makes me nervous. Meaningful life is one where you are useful, where you are needed.”

Optimists, like Mr. Kaplan, see that future as too bleak. Too many people take a “static view” of the labor market, fretting over what happens when today’s jobs go away. “Well, yesterday’s jobs have already gone away,” he says. “And yet here we are, and it hasn’t been a disaster.”

Keep in mind the bigger picture, he says: Companies adopt automation to make products cheaper and to make workers more productive, which creates more wealth and allows the companies to expand and hire more people. This in turn creates more demand for other goods and services, creating yet more jobs. “If you look back historically, there have been times when we went to some transition periods, but there’s always been new jobs and there always been more of the jobs that were not automated that begin to expand, and then those pick up the slack.”

What happens in that transition period is

key, and that’s where higher education comes in. The optimistic “equilibrium view” of automation in the economy — where machines eliminate some jobs but create others to replace them — leaves out the messy process between, where there are lots of casualties and stresses on workers. Yes, technology may create new companies and jobs to replace those destroyed by technology, but those new jobs might take time to develop, they might not be in the same discipline, and they might not be in the same geographic region.

Some higher-education institutions may find a robust market in the future retraining American workers for new positions and new types of employment. Some colleges might have to reconsider the kinds of students they serve, accepting more students who are older and heading back to college to change careers or update their skills. Many colleges, with the help of accreditation bodies, may have to rethink their course offerings and degree programs, putting more emphasis on shorter, bite-sized training programs that get older students back into the workforce more quickly.

What’s more, the most mindful and successful colleges will teach undergraduates how to evolve in their careers, preparing them for a period of exponential change and constant disruption.

SECTION 2



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Voices of Employers

The Jackson Development Zone — simply known as “the Zone” by many in East Lansing — makes working for an insurance company look about as hip as it gets. The Zone’s building sits on East Grand River Avenue, directly across the street from the heart of the Michigan State University campus, adjacent to the bars, restaurants, bagel shops, and college bookstores that students frequent every day. The sign for the Zone — rendered in futuristic red and black font — might be a better fit for a laser-tag arena than a data-processing center. Inside, hundreds of Michigan State students sit at banks of computers in an open-office environment that combines glass, wood, steel, and concrete to give the space an industrial chic that you might expect from a playful Silicon Valley startup.

But what’s really going on inside the Zone represents something new: an effort by a venerable \$200-billion company to develop

a talent pipeline directly from a university, using part-time positions to audition students, groom them for life in the corporate world, and hire the best for careers at the Jackson National Life Insurance Company.

To successfully move students from the world of college to the world of work, partnerships like the one between Jackson and Michigan State may become more common, even essential. Many employers — like the ones listed in the section below — say that they are constantly hunting for high-performing recent graduates who could make a good fit. A barrier for the young candidates often centers on soft skills: Recent college graduates, employers and researchers say, may not display the maturity, initiative, communication skills, and workplace etiquette that would allow them to excel in a corporate environment.

The need for talent right now is urgent — and global. The ManpowerGroup, a human-resources consulting firm, conducted a survey of 41,700 hiring managers in 42 countries, and found that 38 percent were experiencing talent shortages, with the greatest shortages in Japan, Taiwan, Romania, Hong Kong, and Turkey. In the United States,

the shortage stands at 42 percent, higher than the global average. A report by McKinsey & Company produced similar numbers: About 40 percent of employers worldwide, and 45 percent in the United States, said that a skills shortage led to delays and higher costs in filling vacancies at companies. The report noted that 86 percent of U.S. employers said they would pay a premium for “the right talent” to fill vacancies.

Some of these shortages stem from that rift in the training between employers and employees. Decades ago, the transition between college and work was easier to navigate, says Philip Gardner, director of the Collegiate Employment Research Institute at Michigan State University. Employment was fairly stable, with large companies dominating the work world, and those companies were willing to hire people who needed training, on the assumption that most of those employees would stay in the job for many years, allowing the company to recoup its investment.

But in the late 1980s, companies began pushing “rightsizing” initiatives, conducting layoffs amid periodic recessions, and hiring talent when they needed it. These trends spooked American workers, who became less loyal to the companies, jumping ship for other jobs that paid more or offered more security. In response, companies were less enthusiastic about training new employees, who might not stick around. The McKinsey report noted that 93 percent of American employers said they provided training for new hires, but the average number of days devoted to that training was less than at companies in India, the United Kingdom, Germany, Saudi Arabia, and elsewhere.

These trends broke the internal talent pipelines in companies, Mr. Gardner says. Where new college graduates years ago had time to mature in the workplace through their early 20s, “the pace and the skills required when you hit the ground are higher now,” he says. Some of the most valued attributes are also the most difficult for colleges to teach and for young workers to acquire. They don’t have anything to do with technical skills.

“It’s work attitudes and work behaviors, and personal characteristics like resiliency, initiative, and grit,” Mr. Gardner says. “If we just focus on skills and competencies, we miss half of what needs to be done.”

Lower-risk, real-world working situations can provide opportunities to allow students to learn some of these attributes. “You don’t teach initiative and resiliency. You just put people in situations and encourage them, and then watch how they react, how do they resolve failure.”

The Jackson Zone program started as a cost-saving measure for the company in 2003, and it did not focus on students. The company

“They were very book smart, but they couldn’t have a conversation that was meaningful.”

needed part-time customer-service and data-entry workers for peak hours at its corporate headquarters in Lansing, and it marketed the positions to retirees and stay-at-home moms who needed flexible schedules and, at \$12.50 an hour, a little extra money. But soon students from Michigan State started finding out about the jobs and began applying.

“We realized that we had an incredible talent pipeline potential, and as these kids came in, and we could teach them about our business,” says Deidre Kosier, who manages the Jackson Zone recruiting project. “We could see if they would be successful within our environment and then hire them post-graduation.”

To get closer to the Michigan State talent pool, Jackson took over an abandoned Barnes & Noble store on Grand River Avenue in 2013, gave it a modern renovation to appeal to young workers (complete with a kitchen and a hangout space), and hired 160 Michigan State students two weeks before opening, connecting to job candidates with the help of the university’s career-services office.

Today Jackson employs 650 people — 70 percent of them students — as “strategic support associates.” Each associate performs anywhere from three to 10 tasks, which might in-

clude fielding basic calls or editing an address or name of a beneficiary on a client's record. The computers where they sit are arranged in team pods on long tables, and divided according to the focus of that particular team. A student arrives at the Jackson Zone for work, finds an open computer at his or her pod, and gets instruction from a team leader — usually another student with more experience and slightly higher pay. And then they go to work, often with headphones planted in their ears and a phone by their side. Now and then, a student will stop working on the computer to pick up the phone, text a friend, and check Instagram.

In the past, companies like Jackson would ban phones and discourage texting or watching videos. “We let people use technology, we let them text, which is kind of a shift for corporate America,” Ms. Kosier says. Jackson expects a specific level of productivity, and if the students get their work done, what they do at their desk is up to them. “We manage performance, not those behaviors,” she says. Giving the young employees an opportunity to learn how to manage themselves is an important step in workplace maturity.

But the Jackson Zone's grooming goes far beyond that. After Jackson founded the Zone, Ms. Kosier, who has extensive experience in career training and leadership development, realized that most of the students did not have the skills to transition from college to corporate America. They lacked professionalism, skills in networking, communication, leadership, creativity, problem-solving, and critical thinking.

“They were very book smart, but they couldn't have a conversation that was meaningful,” she says. “Even though they were probably recognizing that there were opportunities to do things better, to do things smarter, they weren't raising those, they weren't elevating them to the leadership team, and they weren't thinking like business people.” Sometimes the students initially have trouble with the basics, like turning up for a shift on time. She estimates that 15 to 20 percent of the students working at Jackson had never held a job before; instead of working at a restaurant or a retail store in high school, those students had spent the years leading up to college concentrating on their schoolwork and padding their résumés with

extracurricular activities.

So Ms. Kosier started a program called Launch, offering seminars at the Zone covering how to build a résumé, dress for work, conduct an interview, network with employers or clients, lead people effectively, or deliver an elevator pitch. Helping the students start to build a personal brand in their work, and learning how to convey that brand through employment sites like LinkedIn, is an important part of the curriculum. And managers at Jackson turn up every other week to talk about their career paths, what their departments do, and how students with majors seemingly unrelated to insurance might find a role in the company.

“We need to prepare them for the political realities of a corporation,” Ms. Kosier says, “and help them be successful in navigating that environment.”

The classes are voluntary, but students are paid their hourly wage if they attend. Ms. Kosier's goal is to hire 10 percent of the Zone employees for full-time positions, a goal they have met consistently since the program started. She and her colleagues keep track of who turns up at the classes, showing initiative and a willingness to learn. They watch the students

“We need to prepare them for the political realities of a corporation,” Ms. Kosier says, “and help them be successful in navigating that environment.”

carefully at work, picking out good prospects and courting them for full-time employment after graduation.

Ms. Kosier acknowledges that Jackson might be spending money to train students

who will leave to work for another company. By not having to hire full-time employees for the work at the Zone, the part-time program has saved Jackson \$50-million dollars, so the training expenses are more than covered. But she maintains hope that some of the students who leave will spend five to 10 years in the workforce at another company, then return to Jackson, recalling the support that they got in launching their careers. Some of the students who leave need a little time at another workplace, where they can hone their skills and develop maturity. “We have had few regrettable losses,” Ms. Kosier says.

Voices of Employers

Ms. Kosier’s experience with young employees at the Jackson Zone resonates with what many employers say about recent graduates who are coming to work for their organizations. *The Chronicle* spoke to more than a dozen recruiters and managers at a broad range of major companies, asking them about the kinds of talents and skills they saw among the young people they hired — and what kinds of talents and skills they wished they saw more often.

Of course, the individual companies — including government contractors, nonprofits, consulting firms, construction firms, dot-coms, and so on — all have needs unique to their particular industries. But even vastly different firms note striking similarities in what they want from recent college graduates.

Hard Skills: Necessary, But Not Necessarily Most Important

Many of the companies had aspects of their business that dealt in technical skills of various kinds, often in fields that required some kind of licensure or certification. They hired accountants, engineers, architects, medical professionals, and so on. But the talent-acquisition managers from most of the firms noted that employees with robust soft skills were the most-desired candidates for any job.

“Subject-matter expertise is highly teachable,” said David Ong, the director of corporate recruiting for Maximus, a firm that does public-service work for government agencies worldwide. “It takes an awfully long time to teach somebody about taking initiative, or

how to accept critical feedback.” In interviews with prospective employees, he noted, the vast bulk of the time is usually focused on determining whether the candidates have the kinds of soft skills that the company is looking for.

Marie Artim, the vice president of talent acquisition at Enterprise Holdings (which includes the rental-car company), said that although Enterprise wants prospective employees to have a college degree, the company is not necessarily looking for specific majors or technical skills for the majority of its hires. Empathy, communication skills, flexibility, problem-solving skills, experience in working with teams of people — all of those skills end up being most important in the job. “We have a very wide funnel for our management-training program, which is the vast majority of our hiring, and we’re not looking at a specific major or specific degree,” Ms. Artim said, noting that the company hires a lot of business majors but also graduates from liberal-arts disciplines. “The technical skill is really the ability to learn.”

A Key Skill: Communication

Many of the talent-acquisition managers noted that communication skills — both written and oral — were most often the key skill lacking among college graduates who apply and get hired. Dan Black, the recruiting leader for the Americas at the accounting and professional-services firm EY, noted that written communication was consistently the skill that new hires struggle with. He’s not sure if that’s because those new employees did not get adequate training in writing in college, or “if it’s more that they’ve just kind of grown up in shorthand and text,” he says. “We continue to encourage our university partners to build more writing skills into the curriculum.”

Many of the managers noted that new, young employees opted for modes of communication that seemed inappropriate for the setting. For example, in a conflict situation, the employee might send an email or text to a colleague, rather than walk down the hall to talk it out. The ability to talk (and work) across divides in a workplace are critical, even in industries that are traditionally seen as top-down.

“When most people think about construction, they picture the angry foreman

screaming at the laborers, but today it's all about collaboration," said Greg A. Heiges, a Boston-based project manager for the \$10-billion Turner Construction Company. "Everyone wants a hand in the game, everyone wants a voice. Having employees who can speak up and have a level of confidence is critical."

Leadership: Desperately Needed Now – and in the Future

Many established industries have an aging workforce, and human-resources professionals expressed concerns about how they might

cultivate leaders among the next generation of employees. Generalizations about generations of people are always dicey, but many workplace observers have focused on the leadership skills of millennials. The 2016 Deloitte Millennial Survey noted that developing and supporting leadership ambitions among millennials could lead them to stay at a company longer, while those who felt they weren't being groomed for leadership were more likely to leave within two years.

However, some observers of the workforce have noted that millennials' lack of loyalty to employers and their desire for work-life balance complicates their recruitment as leaders within companies. They may be more likely to see leadership positions as tiring and thankless.

Millennials recently surpassed Generation X workers to represent the largest share of the workforce — more than one in three workers today is a millennial. And 75 percent of the workforce will be composed of millennials by 2025.

With those kinds of demographics, "so many large organizations, and even smaller organizations, with aged workforces are going to need to make a dramatic shift," said Brittany Palubiski, a manager of global university relations and talent acquisition at General Motors. The venerable car manufacturer hires a lot of engineers and other people with technical backgrounds. But she and her colleagues are looking for technicians who can also think broadly about business strategy, push new ideas, and take the kinds of risks that distinguish leaders.

"We want a subset of that population we're bringing in to be the future leaders of the company," she said. "We want people who aren't afraid to come in, have a voice, learn, and earn their stripes. But they have to do that a lot faster than

2.1: CAREER READINESS, COMPETENCIES COMPARED

Employers rate essential needs of career readiness

5-point scale where 1 is Not Essential and 5 is Absolutely Essential



Employers rate recent graduates on competencies

5-point scale where 1 is Not Essential and 5 is Absolutely Essential



SOURCE: National Association of Colleges and Employers Job Outlook 2017

they ever did before.”

Mr. Ong, of Maximus, said that his company actively looks for candidates who had some leadership experience in college — as the president of sorority, for example, or working as a head lifeguard in a summer job. Positions like those are highly predictive of success at the company.

But “employers are getting very nervous about some of the things that we’re reading about leadership skills for this generation,” he says. “There’s a lot of information out there that suggests that millennials are more reluctant to lead than individuals from previous generations.”

This could lead to a short-term crisis among companies, he notes. Many retirements among baby boomers had been deferred during the recession; now that the economy has recovered, companies are scrambling to form leadership succession plans.

“Millennials are going to be managing people a couple of years faster than individuals from previous generations,” he says. “We’re going to come to an impasse at some point. ... Where is the next generation of leaders coming from?”

A Deficiency: Taking Risks and Being Resilient

The Chronicle asked recruiters what attributes seemed to be missing from new employees — what skills they ended up coaching most often. They responded that teaching young employees to bounce back from failure — and even encouraging those employees to expose themselves to the possibility of failure — has been a huge challenge.

Adrienne C. Alberts, the director of talent acquisition for the American Red Cross, says her organization constantly deals with unexpected and new disasters that require an immediate response. Sometimes there is no playbook for how to deal with those disasters, requiring people who can understand the situation quickly and provide an immediate and appropriate response.

Recent graduates seem to be less adept at “the ability to create a way forward from nothing,” she said. “That ability to quickly extrapolate from a similar situation to provide a foundation for how to move forward in a brand-new experience is more challenging

now than it was in students that I might have recruited 10 years ago.”

Mr. Black, from EY, said that he seems to have more conversations with young people early in their career who hit a roadblock with a project or had a conversation with a manager that didn’t go as well as the employee had hoped. “They’re saying, You know, I don’t know if this is for me,” he said. “It’s almost like, Maybe I should try something else if I didn’t get it on the first try.”

Ms. Artim, from Enterprise, posits that the latest generation of workers has grown up in an environment that is too structured — or too “syllabused,” as she puts it. “We struggle with that,” she said. Some of the new employees, for the first time in their careers, are being given individual accountability and the responsibility to do whatever it takes to satisfy a customer. “If you make a mistake, we’ll figure it out,” she said. “But today’s candidates are much less likely to want to take on that responsibility. They’ll go and look for affirmation or confirmation from a manager, even if they are told they don’t have to.”

Cultural Competence: Diversity and Differences

The political tenor of the past year — and the triumph of Donald Trump — indicates that a substantial number of Americans are uncomfortable with people who are different from them racially, religiously, sexually, or socioeconomically. The work world, however, is going in a different direction. Many talent-acquisition managers said they actively look for employees who have experience with people from other cultures and have shown that they can work across cultural lines — in no small part because the most recent generations of Americans are far more diverse than generations that preceded them.

Ms. Alberts, from the Red Cross, said that cultural competence was a huge asset for any prospective employee. Not only is the Red Cross working in devastated communities across the country, where the values and experiences of the victims might be different from the employees of the humanitarian organization, the people who work for the Red Cross might come to the organization for different reasons. The Red Cross has a much larger volunteer workforce than a paid workforce. “The

ability to work with individuals with very different motivations from your own is important to us,” she said. Any leader at the Red Cross has to be able to connect with those people.

Mr. Black, from EY, says his company values a “global mindset” at work, and that the company actively hunts for that among prospective candidates. “I don’t mean that you did a semester abroad,” although that might help, he said. “I mean people who are actively seeking the opportunity to work with, collaborate with, spend time with, interact with other people who are different from you in some way — and a lot of cases a whole host of ways. Different ethnicity, different background, different country of origin, different language, different work style, different generations — all of those things.” Finding people who have those perspectives combined with technical skills can be a challenge, he said.

The Need for More Real-World Experience

Many employers said that they were looking for recent graduates who had some kind of experiential learning in college, and that that experience was often highly predictive of success at a job.

Many engineering-oriented schools — like Drexel University or the Wentworth Institute of Technology — have set up co-op programs that give their graduates an entry to companies like Turner Construction. Mr. Heiges, from Turner, said that there is “no substitution” for hands-on experience in his industry. But he noted that his company looks for real-world experiences that go beyond something set up by the college.

“You look at the kids that were in shop, working on dad’s car, and having that kind of perspective,” he said. “Hiring someone out of college with no experience, makes it very difficult to onboard that individual.” Practice with technical knowledge is only one advantage of real-world experience, where students also have to deal with customers, co-workers, and other situations that train soft skills.

“One of the things that just about every employer can universally agree on,” said Mr. Ong, from Maximus, “is requiring experiential learning as part of the overall education

experience.”

Mr. Ong noted that his own alma mater, the University of Richmond, has promised every undergraduate money to secure an internship or fellowship. “I’m very encouraged when I see schools out there that will guarantee an internship for a graduate before they leave.”

From Elite Colleges to Elite Companies

Some college career counselors fret that top companies are developing tighter pipelines from specific — and often elite — colleges into their workforce. Several companies acknowledged that limited recruiting budgets often pushed those companies to limit their recruiting among selected institutions. One college career counselor said that some companies put a drop-down menu, with a limited list of colleges on their online applications; if your alma mater is not on that list, you can’t apply.

Mr. Ong, from Maximus, said that his company draws most of its candidates from about a dozen elite colleges, which includes Duke University and the University of California at Berkeley.

Representatives from other companies noted that they try to maintain an open door to any applicant. Auto-Owners Insurance, for example, maintains a policy saying that if someone walks in off the street and applies for a job, a human-resources manager will drop everything to give that person a job interview.

Mr. Black, from EY, acknowledged that he had limited resources to visit colleges, but he noted that technology — in the form of internet video — has made it possible for EY to interview students outside of the ones where it often recruits. Ten percent of EY’s hires in the past year came from colleges that EY never visited. And the performance of graduates from those colleges compares well to the employees EY got from the elite colleges where it recruits.

“There is no appreciable difference in performance over the long term,” Mr. Black says. “If you’re doing your recruitment right — if you’re screening for the right competencies and you’re really getting to understand your candidates — then you can have a student from just about anywhere be successful.”

SECTION 3



Mark DiOrio, Colgate University

The Future of Career Centers

W

hen Colorado State University surveyed parents of students about a range of issues a few years ago, one of the questions got at an essential role that higher education plays in society today — and one of the key

expectations people have for a college degree: How could the university most help students and their parents?

The most common answer: Help my son or daughter find a job. And when parents were asked what aspects of the university most interested them, the campus career center came in second to campus safety.

Today, the typical view of the purpose of college is tied directly to employment: In 2014, the think tank New America commissioned

a poll asking prospective students why they were going to college. The top three responses — improving one's chances of getting a job, making more money, and getting a "good job" — scored far higher than broader, less materialistic motivations, like learning about a favorite topic or becoming a better person. Many other surveys have replicated those results.

That connection between college and career is likely to intensify in the future, as a postsecondary education allows Americans to tread water financially. After all, economists have shown that there are significant wage premiums associated with a college degree — because the wages for jobs that require only a high-school degree have fallen, while wages associated with postsecondary degrees have remained stable. And as the price of college continues to climb, more parents and students will ask what kind of return on investment they are getting for their tuition.

"Inevitably, that has pulled career centers into the discussion of how we demonstrate that value proposition to prospective students and their parents," says Emanuel Contomanolis, senior associate vice president and director of career services at the Rochester Institute of

Technology, and a leading voice in the career-services world. He notes that studies have shown a connection between career services and student satisfaction. For example, the Gallup-Purdue Index, in a survey of 11,000 college graduates, found that recent students were much more likely to have used career services, and those that found those services “very helpful” were three times as likely to view their college education as worth the cost and more than three times as likely to recommend their alma mater.

“It’s more expectations, more pressures, more accountability, and more focus on what we are doing that goes far beyond helping students discover what it is they want to do,” he says. It’s really about helping students “achieve what their immediate career goals might be upon graduation.”

Career-services offices — once called “placement offices” — have been around higher education for about 100 years. The offices’ roles grew over the decades, especially after tumultuous times in American society and the workplace. Following the Great Depression, graduates sought help entering the work world and breaking into specific industries. After World War II, as the college population began burgeoning thanks to the G.I. Bill, companies’ recruitment of graduates intensified, and several regional placement associations were established across the country. In time, those placement organizations would coalesce to become a national organization, eventually called the National Association of Colleges and Employers, or NACE.

For decades, career offices have performed a number of core tasks that are still part of the missions of these organizations today: They counsel students on what major they might choose based on the careers they want to pursue — or what careers those students might be able to do based on the majors they have already chosen. They organize job fairs, attracting employers to the campus to talk with students. They review résumés, advise students on how to present themselves in interviews, and, in some cases, take students out on field trips, giving them a taste of — and a potential entry point into — major regional employers.

Experts in career services say that as students and their families have tied college degrees more closely to career, the profile of

the career center has had to grow on college campuses. That growing prominence comes with increasing demands on career services, even as the budgets for most career offices have trended downward over the past 10 years. NACE surveys show that the budgets of career-services offices have gone down an average of 11.4 percent, when adjusted for inflation, since 2007.

But many innovative career offices have actually seen their resources increase dramatically. Those offices are leading the way toward a new role: one that needs to use technology and other techniques to scale up its services, make connections to alumni to raise money and provide professional networks for students, and form partnerships throughout the campus to more seamlessly connect students to careers.

Investing in Career Services, Focusing on Employers

Education is, of course, the business of any college. And it’s often no different for career centers, where staff members traditionally have master’s degrees in education or counseling. But Mr. Contomanolis says that a new kind of career-services staff member is emerging in the field: More often, career services will feature people who may have been corporate recruiters, or faculty members with a specialty in an industry, or alumni relations or development staff members with a strong sales or marketing orientation.

“The field needs different kinds of skill sets and different kinds of perspectives,” he says. On many campuses, career centers are shifting from a focus “that’s primarily counseling-oriented to one that’s really more actively engaged in helping students to make connections, to leverage their networks, to engage with employers, and to create more opportunities for students and employers to connect.”

Bentley University, just outside of Boston, is a business school — the sort of place where the connection between college and career should be crystal clear. And here, the university has put major resources into its career services, which has been rated the best in the country by The Princeton Review. At a college of 4,000 students, the career center employs

about 20 people, at least twice as many advisors as many other colleges of a similar size.

Many of those staff members were recruited from the business world that Bentley students seek to enter. Here, most of the staff members have master's degrees in business administration, and they prefer to be known not as "counselors" but as "strategic advisors," says Leonard Morrison, Bentley's director of undergraduate career services.

What's more, the orientation of the office would come as a surprise to many in higher education: The office embraces the employer, not the student, as its primary "customer."

"The employer is the entity that's buying the product," Mr. Morrison says. "I view the student as the product of Bentley and as a partner in a career process." Viewing the student as the main customer would skew the focus of the office, he says, especially since students can hide in their dormitory rooms and opt out of the career center's services. "So here I can't focus on them as the customer because that would really throw off how I orient my limited time."

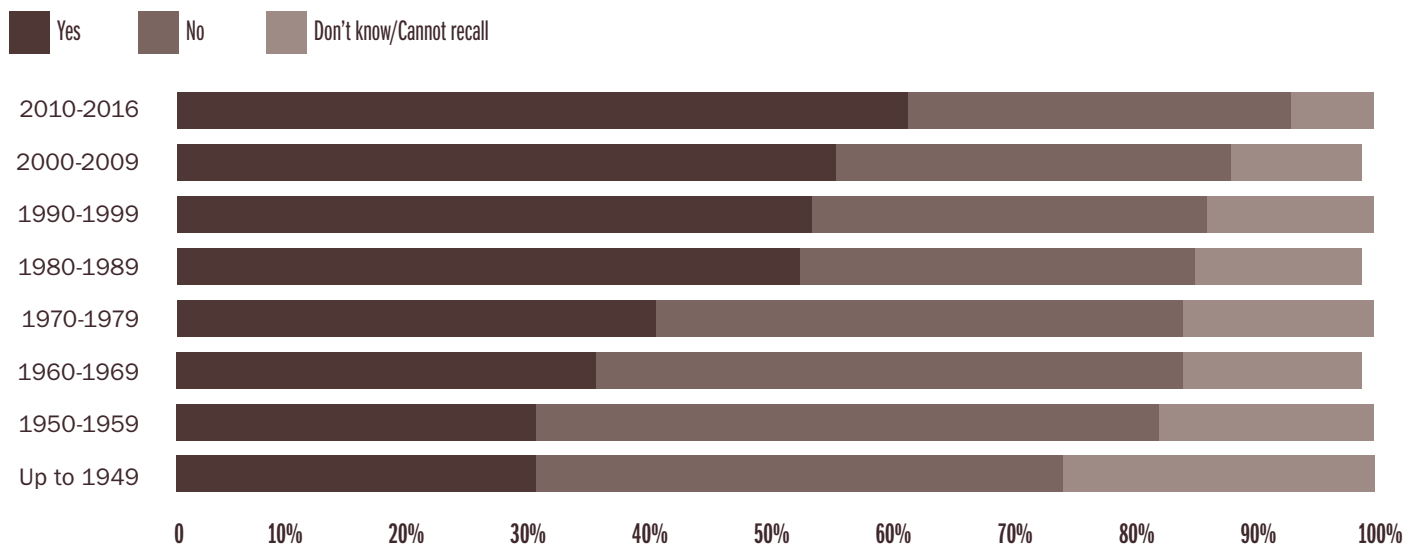
Bentley's staff members specialize in various fields related to majors, like finance, marketing, or sales. During slow times of the year, they meet extensively with employers in

their subject areas, get lunch with recruiters and alumni, and seek to understand the landscape: What roles are the regional businesses trying to fill, and what skills are they looking for?

True to the hard-nosed approach of a business environment, members of the team are evaluated based on placement of graduates in their chosen fields. "It's not enough that you get a job by graduation, because every 21-year-old has to get a job," Mr. Morrison says. "It's considering to what degree your job came from our career fair, a faculty or staff referral, on-campus recruiting, or the conversion of an internship you secured from Bentley."

A challenge for any career-services center is engaging students, who often show up far too late in their undergraduate program — or avoid going to the center altogether in those four years. Five years ago, Bentley started a voluntary career-development class, in collaboration with faculty members and the colleges, taught by staff members in the career-services office. The class covers the basics: cover letters, résumés, networking, social media, etiquette, and so on. The class also incorporates assessments of the students' personality strengths and talents, and how they can exploit those in the work world.

3.1: PERCENTAGE OF COLLEGE GRADUATES WHO SAY THEY VISITED CAREER SERVICES OFFICE, BY TIME PERIOD



Note: Numbers do not add up to 100 percent due to rounding.
Source: 2016 Gallup-Purdue Index



Bentley University

“The goal was no child left behind — that no one could come back later and say, ‘I never saw you,’” says Alyssa Hammond, the director of career education and innovation at Bentley. Thanks to help from academic advisors and marketing, the class started with almost 95 percent of the freshmen enrolled, and today almost all freshmen take the course.

Professional Networking in a Digital World

Some colleges can’t dump enough money into career services to address all of the needs out there. The traditional duties of career counselors — helping students with a résumé, counseling a student on a career, or introducing a student to an employment network — have often been face-to-face, one-on-one interactions with students seeking direction for life after college. There are only so many students those counselors can see in any given week.

Jeremy Podany, the director of the career-services center at Colorado State University, knows of many career offices across the country that don’t advertise their services to students. The reason: “If our marketing plan works, we’re in trouble.”

Given the demand on under-resourced career centers, many organizations will have to find ways to expand their reach without expanding their staff. Technology — which is disrupting the work world, increasing productivity and opening up new roles for workers — has come to career services as well,

and it holds the potential to free up staff members to engage students and companies in more efficient or meaningful ways.

In talks at career conferences, Mr. Podany puts up a slide, asking audience members what decade their career center is in: In the 1990s, career centers would deliver training in a face-to-face meeting with a counselor, who might give the students handouts. In the 2000s, they might have transferred some of that content to a website. Today, career centers can create online learning modules that incorporate videos, assessments, games, and other interactive features. Staff

members at CSU came up with such a program, delivering training on 51 skills to help students kick start their search for a job before graduation. To date, students have completed more than 11,000 of those training modules. Colorado State delivers those modules through software from a Fort Collins company called TuaPath.

A number of other technology companies populate the career space: GradLeaders, NACELink, WayUp, Pymetrics, and Symplicity, to name a few. Some of them have been founded by recent graduates who were frustrated with their job prospects during and after college. Among the best known is Handshake, a company that uses an online platform to let students post résumés and search for jobs, while also allowing employers to search for candidates among college students, post jobs, and register for career fairs. Three graduates of Michigan Technological University, an institution in the Upper Peninsula, founded the company, hoping to give students from other remote colleges a better shot at landing jobs.

Mara Zepeda, an alumna of Reed College, started her company, Switchboard, after she made a visit to campus during an alumni-board event. She ran into a student in her old dormitory — an economics major — who asked for help in landing a job. Ms. Zepeda put her in touch with a friend at Credit Suisse, who hired the student.

Ms. Zepeda was thrilled by the success of the interaction, but realized that kind of help couldn’t scale merely through random encounters on campus. Technology had to be

an answer. So she started Switchboard, which helps connect current students looking for jobs and internships to alumni who have job leads. She sees it as a way not only to help students land on their feet in the job market, but also a way to financially support liberal-arts colleges, like her alma mater.

“Three revenue streams for higher ed — enrollment tuition dollars, retention tuition dollars, and alumni tuition dollars — all pass through professional development,” she says. “Students and families won’t pay unless they have the promise of ROI, students can’t afford to stay unless they have professional-development opportunities along the way, and alumni won’t give unless they feel their degree was worth it.”

Employers, too, will use more technology to expand their reach into campuses, to vet students, and find graduates who match up to positions in their companies. Of course, companies are already utilizing tools like LinkedIn and online niche job boards. They also work with student clubs and organizations, surfing social-media communities to identify students who are talking about their work, or have interests that align with the skills they’re looking for.

More career-services offices are also setting up facilities where students can chat or interview with recruiters via online video. Something as simple as video interviewing has always had fits and starts,” says Mr. Contomanolis, but now it appears to be taking off.

He also believes that employers will use more sophisticated personality and aptitude testing to narrow down their pools of candidates to people who will likely make good fits. The companies might use data analytics to

find features and patterns among their most successful hires, then try to find those features among candidates.

“I also think you will see a greater emphasis on creating communities — communities of students, communities of alumni, communities of recruiting organizations — and creating communities for people to interact in different ways,” says Mr. Contomanolis. Social media will be one of the main vehicles for those communities.

Engaging Alumni: The Colgate University Story

People from Colgate University will tell you that their institution’s alumni network is a bond that connects graduates to each other across generations, across class years. It probably has something to do with the isolation of the college, alumni say: Students at Colgate — nestled in the hills of upstate New York, far from the distractions available to students at more urban colleges — have to rely on each other for socialization and entertainment, scholarly stimulation and discourse.

And, when they leave Colgate’s cloistered valley, they turn to each other for job leads. Many colleges with far-flung alumni hold events in cities based on class year or sporting events. Colgate’s 32,000 alumni were less interested in those kinds of engagements, says Murray Decock, the senior vice president for external relations, advancement, and initiatives.

“They really cared about gathering as real estate networks, lawyers’ associations, digital media, not-for-profit, or health care,” he says.

Colgate created 10 networks that includ-

3.2: QUALITY OF CAREER SERVICES EXPERIENCE AND RETROSPECTIVE EVALUATION OF UNIVERSITY

	Yes, did visit career services	No, did not visit career services	Career services "very helpful"	Career services "not at all helpful"
My university prepared me well for life outside of college	34%	26%	58%	10%
My education was worth the cost	49%	49%	72%	24%
Extremely likely to recommend alma mater to family, friends or colleagues	45%	38%	68%	20%

SOURCE: 2016 Gallup-Purdue Index



Colorado State University

ed those professions, along with banking and finance, media and communications, consulting, entrepreneurship, and science, technology, and engineering. The idea was to make the network definitions loose enough that they would draw alumni from different but related kinds of professions. Alumni, even many years out of college, were still trying to navigate their careers, Mr. Decock notes. They have been able to connect with recent Colgate graduates who are still trying to establish their own.

But the university didn't stop there. It moved career services from student affairs — where most college career offices preside — to alumni affairs and development, to put an external, networking emphasis on career-services operations. Colgate puts on events like SophoMORE Connections, a three-day conference, held during winter break in January, where more than 100 Colgate alumni return to campus to tell sophomores about their professions and how to land jobs in them. In addition to a series of small-group question-and-answer sessions organized around the 16 professional categories, the event includes a reception and dinner, where the second-year students can mingle with alumni and work on their networking skills.

Michael Sciola, the associate vice president of institutional advancement and career initiatives, says the career office has been assertive about reaching out to alumni, with three requests: Hire Colgate students and graduates for jobs and internships, tell the college about opportunities that might benefit the careers of students and graduates, and financially support the college's career programs and internship funds.

"What are the levers we can pull? We're going to pull them all," he says. "Any campus not thinking that way is doing that to the detriment of the future success of their students."

In the process of moving career services into advancement, the operating budget and staff for the career-services office doubled. The office's travel budget — used to connect to remote alumni and employers — went from \$3,000 to \$80,000 within three years. This year, the college is breaking ground on a new career-services building, located a stone's throw from a central quadrangle on campus. Money for the \$16-million building was donated by a prominent trustee, alumni, and parents.

Asking alumni for their career advice has been a way to engage recent graduates, who may not yet have the money to give to the program or the college. "We're valuing the experiences that they had and where they are right now in their lives, even if they aren't necessarily large donors," says Teresa Olsen, Colgate's assistant vice president of institutional advancement and director of career services. Because of that substantive engagement, those alumni may be more willing to give in the future.

Colgate has been in touch with other colleges — such as Hamilton, Hobart & William Smith, and Williams — about how it restructured career services around alumni. Mr. Contomanolis says that colleges that see alumni engagement as part of their "lifeblood" will probably follow the example of Colgate and other such colleges.

"In the next five or so years, you will absolutely see all career-services offices working very, very hard to either strengthen their existing alumni networks and connections, or to

expand them — or in some instances actually to create them,” he says. “It’s very clear alumni helping students is part of the success mix.”

The “Radical Integration” of Career Services

Colleges with diffuse alumni might have a harder time trying to connect students to its far-flung graduates. And for very large institutions, such a task might be impossible. Managing the relationships between 50,000 students and an equal number of alumni at a large state university may require a career office with vast resources and personnel.

Rather than pursuing support outside the university, career offices should cultivate support and collaboration from within, some career-center directors say.

Mr. Podany, from Colorado State, is the founder of the Career Leadership Collective, a coalition of career-services directors and employees who are trying to rethink the role of career services on campus. Given the limitations on resources at many colleges, Mr. Podany says, career services can’t expect to see their ranks grow to address all the things they need to do. But there are some changes administrators can make to broaden the impact of the career center:

Break Down Silos: “Where we’re going to fail as career centers is if we perpetuate the silo mentality on university campuses,” he says. That is, if career centers tussle over ownership of every career initiative on campus, and need to put their brand on everything or sign off on everything, that will impede a larger discussion about preparing students for the work world. “We need to think radically different and say, ‘We care about the mission of career, period. It doesn’t matter if my name’s on something.’”

He cites a campaign that CSU’s admissions office recently put together: Called “The CSU Effect,” it prominently touted employment statistics (84 percent of graduates get a job within six months of graduation, three out of four are employed in a field related to their major, etc.) alongside information about the amenities in Fort Collins and testimonials from students who are working dream jobs.

“I walked into a meeting with alumni, admissions, the president’s office, the V.P of mar-

keting, and institutional research, and we had a bunch of data,” he recalls. “And I said, ‘I don’t think the career center’s name needs to be on this at all,’ and \$50,000 dollars got thrown on the table and we created the CSU Effect.”

Help Faculty Teach Careers: Part of the future success of career centers is about creating partnerships like these — but also with faculty members and academic departments recruiting people around the university to help provide career training for students.

“Today, at almost every college campus in the nation, there are faculty and staff who are not in the career center, having conversations about their career with students,” he says. In the past, administrators and faculty members would send those students to the career center for a deeper conversation. “I actually think we need to go to the faculty and say, ‘Let me teach you how to have a great career conversation.’” Although some see faculty members having a reluctance to talk about the connection between academics and jobs, Mr. Podany has seen less of that conflict in the past five years.

Elevate the Job of the Career-Office Director: If career-center directors are going to adopt a “growth mindset,” they will have to take on new roles. “People leading career centers have to have fund raising as part of their portfolio,” Mr. Podany says, citing one new role. Career-center directors have ample opportunities among alumni and businesses to raise money for career training. “People want to give to a mission of meaning.”

And to help career centers cut across activities on campus, college leaders might consider elevating the position of the career-center director to a top administrative position, reporting to the president. At one time, he points out, fund raising and development directors were not top administrators; then state support dwindled, and the role became vital.

Those days have come for career services. “Ask the admissions office what their two biggest deals are when they talk to parents and students: Future and finances win hands down every time,” he says. Careers “has to be a cabinet-level position, because it’s working so closely with the provost and associate provost and all the other VPs to make sure that it’s a transformative part of the experience.”

SECTION 4



Stuart Bradford for The Chronicle

A Conversation with Philip Gardner

Philip Gardner is one of higher education's leading scholars of the transition from college to work. Trained in economics, organizational development, and public policy, Mr. Gardner has been at Michigan State University's Collegiate Employment Research Institute for more than 30 years, where he is the director. The institute has long researched how graduates enter the workforce, the impact of internship and co-op programs, recruitment trends, and how students acquire skills. Mr. Gardner also supervises Michigan State's career center, and he has been a prominent voice among college-career professionals.

Mr. Gardner has been an advocate for creating so-called T-shaped professionals through education. The T-model is a metaphor for the kinds of skills he and others believe workers need today: They must have deep knowledge in a discipline and a system, forming the vertical line of the T, but also communication skills, curiosity, empathy, and

other soft skills that allow them to relate to and interact with workers from other systems and disciplines.

Mr. Gardner is retiring from Michigan State this year. This spring, *The Chronicle* spent several days with him, culminating in a series of discussions covering the future of work, the challenges facing today's students, and what colleges can do to help prepare students for the workplace. The interview, with material



pulled from those discussions, has been edited for length and clarity.

What do you see as the major challenges today in terms of starting a career and maintaining it?

The world is now much more chaotic. It's faster, and it's continually changing as different factors come into play, whether it's automation, which is a big one, or any of the other factors affecting the workplace. People, whether they're already in the workplace or planning to enter the workplace, have to be prepared to be adaptive and to innovate. They are not going to be doing the same thing all the time. These jobs are going to morph into new things. You need a core set of skills to rely on that allow you to transcend boundaries and change.

Are most colleges still teaching to a world that is static? Or have they adapted to this more fluid and constantly changing world?

From what I see, we're caught in the middle. We're trying to let go of ways that don't work anymore. And yet we do have some really inspirational ways that learning and technology have come together to create whole new ways to learn, to experiment, and adapt. So I think we're caught on a continuum.

Is there a gap between how we teach students in college and what the employers really want? In one of our conversations, we talked about how colleges teach students about cultural diversity — giving them exposure to the fine points of different cultures — but then employers say, "I just want them to know how to grab a bus in Stuttgart and get across town."

Well, the problem is, who are we talking about at these companies? If I ask CEOs and top-level executives in any company or organization — whether it's nonprofit or for profit — they're going to talk about cultural awareness and dealing with the diversity. But when you talk to entry-level line managers, they just want to get tasks done. One of the basic things for them is, can you make an international call to your counterpart in Stuttgart or in Dubai and find out how that particular piece of equipment works? Do you have enough ability to talk on the phone? So there's a big gap in what's expected.

So what are we shooting for when we when we graduate somebody? Are we just going

to get them that first job with the minimum requirements, or are we really trying to prepare a person with the assets that can meet the challenges five to seven years out? You are going to need to broaden out the skills quite quickly. If those employers said, "All I need is somebody to make an international call," we

"If you can't adapt your work to the context you're in, and you're limited within your own context, then you've got problems."

really need to push back: What goes beyond that? These new employees are going to face situations that are much more complex than that. When students get the first job, that's pretty basic. But then they get blindsided when, three to five years out, suddenly the complexity of job really, really changes.

So colleges are right in teaching them more loosely, focusing on the broader concepts?

We've got to plan more than just getting them qualified to get a job. We have to do that as a minimum, but we really need to prepare them for this transition that they're going to go through early in their career. Here's the catch: Nobody's measuring that. The only thing that matters is that first job and its starting salary. End of story. Why aren't we collecting data over that first 10 years to see how the education and all these broader skills come into play? Because we know from surveys from the Association of American Colleges & Universities that as employers get these young people into the positions and begin to move them up, major becomes less important and the competencies, behaviors, and attitudes become much more important.

How do you think the so-called gig economy will unfold in years to come? How do we prepare students for that, and what will it look like?

It's been going on for two decades, but

it's really become popular with the advent of Uber-like opportunities that glamorize and grab our attention, and we think the whole world's going to be like that. I don't see this moving rapidly that way. I think you're going to see more and more gig-related opportunities coming up, but I'm a little more cautious about saying everybody's going to eventually work that way.

But young people have to be prepared for it. What we're beginning to hear is people saying that when they get to their second or third assignment in a company, all of a sudden the company says, "These are the projects coming up, and you're just going to have to bid on them." Essentially, you're going to become one of these 1099 employees. There's a lot of risk and uncertainty, and young people are not prepared for that. A lot of people are interested in being entrepreneurial, but that's a little bit different from these people who are asked to bid on their next project, and if you don't get picked, you're out of the company.

What about automation? Will that boost productivity and create jobs, or destroy jobs and put people out of work?

Economists disagree on this. Both good things and bad things are going to happen. The economists that take the Schumpeter, "creative destruction" approach — that technologies will destroy certain jobs but they're also going to create all these wonderful jobs — they're probably right in some respect. And then the doomsayers who think all these people are going to lose their jobs, they're partially right, too. Lawrence Katz, the economics historian, has talked about the hollowing-out effect of technology. It does two things: It either requires more skills, or it decreases skills to a lower level and, of course, lower wages.

What the optimists don't take into consideration is how fast those new jobs appear compared with how fast the old jobs are lost. Job losses can be very fast, while job growth can be very slow. It's not a quid pro quo. And they don't say anything about where those jobs are located. So if I'm stuck in Lansing, Michigan, and then the new jobs are in southern Alabama, I may not be able to take advantage of those, and the required skills might change.

Thomas Friedman, in his newest book *Thank You for Being Late*, talks about how technology takes some jobs and pushes them

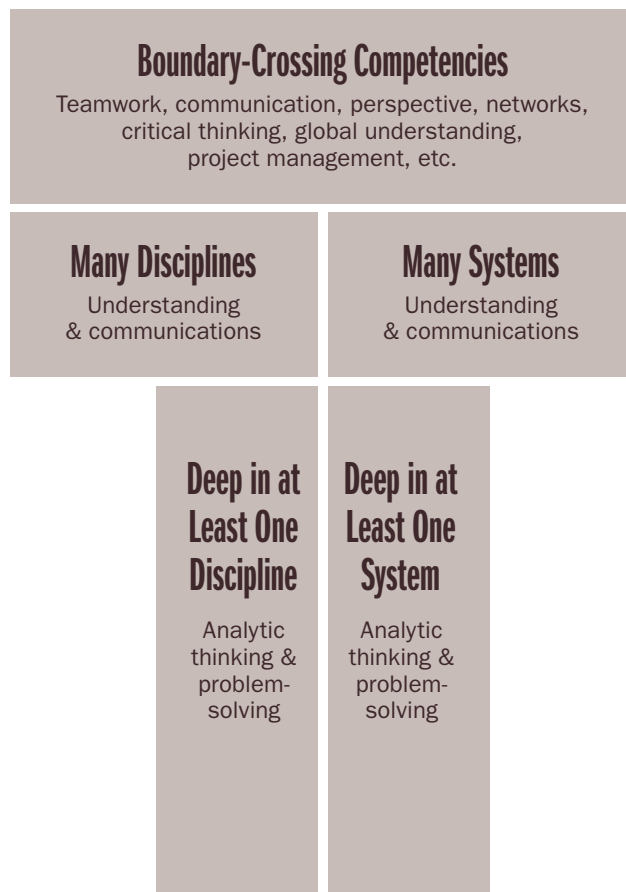
up, which means that technology takes care of the easy stuff. What's left has to be done by somebody with higher-level skills. And technology pushes some jobs down, requiring less skill. And some jobs get pushed out, which makes room for entrepreneurial activity. It's going to come very fast, and it's going to affect wide range of people.

To adapt, you've advocated for the "T-shaped professional." Can you describe that concept?

It's a person who comes through and gets depth in a disciplinary knowledge, where they pick up their problem-solving skills and a lot of information driven by discipline. Then they also become truly interdisciplinary in being able to talk with other majors by picking up these other skills that are broad skills — project management, cultural awareness, critical thinking — which require you to cross multiple boundaries.

Its origins go back to the early 1990s in

4.1: THE T-SHAPED INDIVIDUAL



the U.K. They looked forward to the kind of technologies that were coming and the type of people that would have to build those technologies and service them. These IT specialists were going to have to take on a whole range of different skill sets: They were going to have to get out from behind their computers and talk with people who don't have computer skills. They called for somebody that had depth, that can cross different functional areas.

It got picked up by Tim Brown at IDEO, which is a major design and innovation firm, and he became an evangelist for it. And where it really caught on is with companies adjacent to IDEO in the Silicon Valley, like IBM. They were finding that when they sent out engineers, IT folks, and computer scientists to solve a problem, they could solve the mechanical problem, but the problem actually was embodied in a system where it moved somewhere else and appeared in a different form. That's when they realized that we had to have different kinds of people out there, that we had to embrace different kinds of academic backgrounds. If you can't adapt your work to the context you're in, and you're limited within your own context, then you've got problems. So the T involves putting a person in multiple contexts, getting them to learn how to learn and how to utilize the information that you have, and being able to converse with a wide range of people.

You have advocated for systems thinking in higher education, especially related to the T. Why is that relevant?

The origin of systems that's used in the T-shaped professional comes from Donella Meadows's work. She was an environmental scientist, but had the general idea that you attack a problem by knowing the system you're working in. You want to know what the implications are as you take different approaches to solving the problem. So if you want to be a nurse, you can study nursing. But you also have to study what's happening in the health-care system, what's going on between different players, from hospitals and ambulatory care, to the impact of government policy on the work, or how to approach patient care. How well do you understand the system, so you can not only navigate it but also solve problems and be proactive? Once you begin to see intersections between different systems, there are

spaces that offer opportunities. Those are the niches where jobs are going to grow, where new opportunities are going to be.

But you're talking about teaching these systems in the college environment, which is extremely siloed.

Yes, that's a huge problem. If you're going to build the T, you've got to have the silos come down a bit. You've got to learn how to transcend the silos, and that's a major challenge. The problem with reducing silos in higher education is that the reward systems for faculty aren't there. The reward system is built around research, which is more siloed than anything else. Research universities will be harder to transform than other universities. We see mid-tier schools and others being able maybe to do some transformation faster.

One of the biggest problems with career services is that it has been siloed away, and the future of career services really depends on its ability to break down silos and become ubiquitous on campus, or it will just continue to be the silo that moves around depending on the whim of how important it is at any given time.

What should the career center become in the future? What role should it have?

The career-services office was set up as a siloed department, and its origins were to get students jobs and place people. Some schools had a career-development unit that was related to counseling, but very few were in the academic side of campus. Most of it was a service provided to students through student affairs.

Academic learning and experiential learning are so woven together. The ideal dream would be for career services to be ubiquitous. It's just part of the fabric and it's blended in, but it means that people have to be more attuned to learning and the advances in learning, and how to frame learning outcomes that attain both academic and professional objectives. They're not going to be able to just do the career fairs and event planning. They're going to have to understand pedagogy and curriculum development as it's evolving with technology, in contextual learning and continuous learning. So I see a completely different kind of career-services person emerging, rather than somebody who is going to sit and wait just to advise students.

Does the career-services office just go away, with career professionals simply embedded within each of the academic departments?

I think you have to have a core team that's responsible for career services. It probably has to be a department or unit, because that's how colleges are set up, and they might be responsible for data collection, HR, or finance. But mostly they have to be responsible for providing the enrichment opportunities, the continual professional development, the continual energizing of career people who are embedded everywhere. Because once you get immersed it's easy just to get captured by the department where you're immersed and lose sight of the bigger picture. There is a central core function that has to keep the network alive and growing.

Students perform various jobs on campus as part of the college experience — like working in dining halls or on landscape crews. They're often menial jobs. How can that work be elevated to something that will train them for careers?

If you want to give some kudos to college campuses, this is something that they have taken seriously in many places, even in what we would call menial jobs. Here at Michigan State, culinary services has put together a development and training program for the people who work in the dining halls, so they can understand and gain professional skills. And you see a lot of campuses that have changed such positions into internships. Once they do that, they have to have some learning objectives. The State University of New York at Stony Brook is an excellent example of a campus that's doing really good work in this area. A lot of community colleges have done that because there's wonderful opportunities here to train.

The challenge is, you have to have somebody who can go out and train people who aren't used to doing this kind of stuff. You have to supervise it differently, and you have to have some commitment. And every time a person leaves and somebody new comes in, you have to start all over again.

But I think there's a lot going on here. Any schools that have not looked at this seriously should be ashamed, because we've been talking about this for a number of years, and it is catching on.

Pundits and policy makers have talked about how the recent generations of young people will have less wealth than their parents did, and that they'll have a harder time in the work world. Psychologically, how do you think that affects the outlook for today's students, their attitudes about their work or their careers? Are they anxious entering the work world?

That's a good question. Most of the young people I talked to are excited about their opportunities, but there is some pessimism out there. I think when they get pessimistic is when they get to around age 30, when the options begin to change and they don't see the path that they may have thought was going to be there, or they get detoured, or they didn't plan at all. Then they fall off a ledge.

I have read all the stuff about how they are going to be worse off, and that may be true. But I also see them coming with different assets that are going to capitalize on the economy, better than boomers. Boomers are really not adapting well to this new economy at all, and that's why there's so many struggling out there. But the young people have the tools, they have the ability, and they're just going to have to figure it out. The ones that don't continue learning — and that doesn't mean getting more degrees, but simply finding ways to invest in themselves — are going to fall further and further behind.

Do you think there's a there's a substantial role for colleges in helping those people at age 30, 40, or 50 that have either fallen off the ledge or just need some career guidance?

Education systems can do that. The problem is that a lot of colleges and universities think in degrees. You've got to come to school to get a degree. And what people are looking for is not a new degree, but they're looking for ways to get quickly retrained in something, quickly getting skills because they've already got the degree. They want to come in and take three or four classes in sequence to quickly to give them a greater array of choices. Educational institutions that capitalize on that — and get away from only providing opportunities for people who want a degree — will find a lot of room to thrive, as long as it's high quality. We're just in the early stages of an evolution of higher education in responding to these kind of situations.

The Path Forward

Raihaan Darr, the Missouri college graduate from our introduction, is trying to figure out a way forward. He recently discovered a promising new occupation: user-experience design, which focuses on improving people's interactions with products like cell phones or websites. He's now taking online classes in the field, trying to build a portfolio that will help him land a job. He notes, with palpable excitement, that careers in UX, as it is sometimes called, can pay \$70,000 to \$90,000.

With a strong portfolio — along with his training in finance and his ease in talking with people — Mr. Darr should be a success in time. Perhaps with that success, he will look back on his college experience and decide that it wasn't a waste of effort after all.

But colleges can do much to make sure that their graduates are not drifting and embittered, like Mr. Darr. Academe has long been suspicious of, and even hostile to, notions of vocationalism in higher education. But the imperative for higher-education institutions should be clear: training for life and training for work do not have to be separate activities. Colleges can, and should, embrace both. Given our need for both a strong workforce and an educated citizenry, the role of higher education is more vital than ever.

Elevate the Career Center

First, colleges should elevate the career center. Career offices have suffered cuts at colleges in the past 10 years, precisely at the time when students have needed their services most. But raising the profile of the career center does not merely mean throwing more money at it. College administrations, led by people at the top, should give serious consideration to how the campus career center should be reinvented or reconfigured. There

is no single solution or model for all colleges: Some may choose to more closely align their career centers with alumni organizations, as Colgate University has, and some may push career training deeper into the academic function of their institutions. Either way, career-services offices will need strong leadership and opportunities to make connections across campus. To be successful, that work must be supported and promoted by top leadership on campus.

Break Down Campus Silos

Second, colleges may need to break down silos on campus. Interdisciplinarity has often been dismissed in academe as hype and as an approach that may dilute the power of disciplines. Certainly, academe needs rigorous disciplines that produce graduates with deep knowledge in particular fields. But undoubtedly, the work world — and society in general — increasingly grapples with complex problems that touch an array of disciplines all at once. Graduates who are able to think about and communicate across those various disciplines will be in the best position to lead companies and communities toward solutions.

Focus on Retraining

Third, amid disruptions in the workforce caused by technology, colleges and universities could have a growing role in retraining people for new and different employment. Scott Latham, the vice provost for innovation and workforce development at the University of Massachusetts at Lowell, likens that role to a scene in the sci-fi movie *The Matrix*: Eager to get out of a dangerous situation, one character in the movie spots a helicopter on the roof of a building, and within an instant, mentally downloads the skills to fly it. Of course, re-

training for a new job is much more arduous, and whole populations of displaced workers sometimes resist that change. But colleges can help that transition — and perhaps find new sources of revenue — by devising programs to retrain people quickly yet effectively.

Build Campus Programs Relevant to the Workplace

Lastly, colleges should start new projects or enhance ones that already exist on campus that have relevance for the workplace. College administrators may not know where to begin to leverage some of the activities that already exist on campus. What follows are a few models that may generate ideas for college leaders. A collection of articles about these projects and other innovative ways that colleges and universities are engaging the world of work can be found on *The Chronicle* website. *The Chronicle* will continually add new articles to that page in the months ahead. Go to <http://chronicle.com/futureofwork>

The Example of Work Colleges: Work colleges are a federally designated category of liberal-arts colleges that incorporate work on campus as part of the student experience. There are only eight work colleges in the United States, although some colleges without that designation — like Berry College in Georgia, or Deep Springs College in California — incorporate elements of the work colleges into their curriculums.

Work colleges started out as a way for students to help pay their way through school, trading sweat equity for education. But today, institutions like Warren Wilson College in North Carolina and Berea College in Kentucky view their work programs as another form of education: Work on campus — whether it's tutoring students or mucking out horse stalls — teaches young people about teamwork, leadership, responsibility in a job, and pride in one's work.

Given the federal requirements associated with the work-college designation — not least, the administration needed to find and provide a job for every student on campus — it would be difficult for any college today to become a work college. (However, Paul Quinn College, a historically black college in Texas, reorganized itself as a work college two years ago.) But any

college could shift its work-study programs and other jobs on campus, pushing students to focus more on developing essential skills for post-college employment, rather than merely on a paycheck.

Laboratories for Makers: The maker movement has inspired engineering departments, art schools, and even libraries to set up drill presses, laser cutters, 3-D printers, and other machines, allowing students to reserve time on them to tinker. Even by merely playing around, students will learn how to use some of the latest technological devices and programs, which could be useful in the workplace. But the real power of a makerspace is not in its power tools, but in the way that it can bring together students from different disciplines and backgrounds to work on entrepreneurial projects. Also, there is power in engaging projects with one's hands. As Richard K. Miller, the president of the Olin College of Engineering, puts it: "Learning to make things is inherently experiential, as compared to learning about things, which is much more cerebral."

Case Western Reserve University's makerspace, called think[box], represents an interesting model that is highly relevant to the future of work. While many campus makerspaces are reserved for specific disciplines — say, art students or engineering students — think[box] is open to not only all majors, but also people outside the university. Case Western students could find themselves working side by side with tinkerers from the local neighborhood, inventors from the local design firms, or doctors from the nearby Cleveland Clinic.

Case Western Reserve University has added dimensions to its makerspace that make it especially relevant to the world of work: Think[box] includes staff members who help students secure intellectual-property rights on their inventions and advise them on business plans to push them out into the marketplace.

Engaging Cities: Colleges have symbiotic relationships with the cities around them, and many institutions have effectively used their cities as "living laboratories" where students can conduct research or engage in service-learning opportunities. But too often those projects are limited in scope and impact, and students get the sense that their work will never be taken seriously, let alone implement-

ed (and the amount of effort they put in often matches that expectation).

The Sustainable Cities Initiative at the University of Oregon provides a model to expand those relationships between colleges and towns. SCI brokers relationships between city administrations and faculty members and students from more than a dozen disciplines at the university. Each year, SCI chooses an Oregon city (or sometimes an entity, like a mass-transit agency) as a client, then helps to organize student work in dozens of classes, aimed at helping that city or agency solve persistent and puzzling problems. The clients, which pay \$200,000 to \$300,000 for the yearlong partnership, appreciate the students' work, which draws from the latest research, presents unconventional solutions, and saves money. Just one student project at a solid-waste plant in Salem, Oregon, saved that city \$1 million per year.

But more important, students say their experience with SCI is some of the most relevant and rewarding work they experience in college. Students get exposure to all of the skills they would need in a workplace: collaborating in teams, conversing with clients, hitting deadlines, staying within budget. But they often also get the satisfaction of seeing their coursework become reality in those cities.

The Sustainable Cities Initiative runs a conference every spring detailing how colleges can set up their own version of SCI.

Journalism Training for Non-Journalists: Student newspapers churn out stories every day on hundreds of campuses across the country. Some of those newspapers — like *The Cornell Daily Sun* or the *Yale Daily News* — are as good as any small newspaper in the country. Other student newspapers read like what they are: a training ground for students who are just beginning to learn the techniques of journalism.

But many of those techniques stand as vital skills for any profession: Students adept at communication — in both written and oral forms — will immediately stand out among other candidates for jobs. Writing for publication — particularly as a news reporter — also teaches students how to think critically, ask difficult questions, read closely, and study a broad range of sources. But newspapers also need an array of employees apart from journalists: designers, artists, business managers, accountants, salespeople, human-resources professionals, and so on.

Journalism is a beleaguered industry, going through a series of convulsions and contractions in recent decades. Given that, it may seem odd to promote a newspaper as a training ground for students. However, the appetite for media is as strong as ever. Colleges should consider giving more support and guidance to the publications they have on campus, viewing those publications as a vital place to learn critical skills for employment.

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