

## **EconoFact Chats: AI, Public College, and the Changing Path to the Middle Class**

**David Deming, Harvard University**

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Michael Klein:

I'm Michael Klein, Executive Editor of Econofact, a non-partisan, web-based publication of the Fletcher School at Tufts University. At Econofact, we bring key facts and incisive analysis to the national debate on economic and social policies publishing work from leading economists across the country. You can learn more about us and see our work at [www.econofact.org](http://www.econofact.org).

Michael Klein:

The loss of good jobs that pay well is a major concern. Manufacturing had provided workers who had no more than a high school education an opportunity to be solidly in the middle class. But the number of those jobs has been shrinking in the United States, as well as in other industrial countries. Education and skills training seems to be an important way for people to have jobs that provide them with a good living and also to enable them to pivot to new jobs or even new careers as the economy changes. Are public policies needed to help promote the acquisition of skills that enable people to get good jobs that pay well? And if so, what are those policies?

Michael Klein:

My guest today on Econofact Chats, David Deming has thought long and carefully about these questions. David is a professor at the Harvard Kennedy School and the Harvard Graduate School of Education. His research focuses on the economics of skill development, education, and labor markets. He is one of the principal investigators at the CLIMB Initiative, an organization that seeks to study and improve the role of higher education and social mobility. David, welcome to Econofact Chats.

David Deming:

Great to be here, Michael. Thanks for having me.

Michael Klein:

David, you very kindly contributed one of our very first Econofact memos on unemployment and manufacturing. You presented what I saw as a very striking result. You showed that manufacturing employment declined in the United States, even as the output of the manufacturing sector stayed steady. So the implication is that machines were replacing people on the shop floor. Why is a loss of manufacturing jobs important for people who don't have a college education?

David Deming:

Well, it's a great question, Michael. One that I was interested in when I first wrote that memo and I'm still interested in. I don't think we've fully solved this important issue. But just to kind of fix ideas here, what this memo was saying was that when you think about the health of manufacturing as a part of the economy in the U.S., you get a very different answer if you ask the question what's happening with manufacturing jobs, versus what's happening with the manufacturing industry. Manufacturing industry in the U.S., at least in when I wrote the memo in 2017, and I think it's still the case, was doing really well in terms of value added, meaning essentially the value of goods and services minus the cost it takes to produce them. U.S. manufacturing is second in the world only to China. And, actually U.S. Manufacturing is pretty productive as an industry and pretty successful.

David Deming:

It's just that manufacturers are employing fewer and fewer people to achieve that productivity. And so what that means is it actually manufacturing employment has been in long run decline for almost half a century in the U.S. And, while it did accelerate in the 2000s in part, because of the opening of trade with China and increased import competition from Chinese manufacturers, it's very much in a trend. If you look at this half-century trend and manufacturing employment, it's just going down, down, down with no real sign of coming up. And if it does here and there, it's only a little bit. And so we are just at the point where we need to start thinking about a solution that is longer run. That accounts for the fact that manufacturing is probably never going to be in the U.S. a major part of the competition.

Michael Klein:

And that was important because, even if you didn't have a high school education, that was a way that you could get a pretty good paying job and put yourself very solidly middle-class, right?

David Deming:

That's right. So if you look at the subset of jobs that pay middle-class wages, and can allow you to have a family, own a home, and fulfill the American dream, the share of jobs that allow you to accomplish that while not having a four year college degree is getting smaller all the time.

David Deming:

And it was the case that most of these manufacturing jobs were unionized. They had pensions. They guaranteed hours and they guaranteed a pretty high wage because of union bargaining and contracts. And the decline of unions in the U.S. is very much a story about the decline of manufacturing. These two things go together. There are some service sector unions, particularly in governments, say local governments, but they don't really account for a high share of service sector jobs or jobs in other sectors. And what you see is that there's a kind of dual-track labor market for folks who have four year college degrees. They're able to climb the job ladder, get a job in their twenties, advance up the career ladder. Eventually start a family, own a home. And for folks who don't have a college degree, that's just getting harder and harder all the time. Manufacturing was a big part of the story for people without a college degree achieving economic success in the U.S.

Michael Klein:

So one way to address that problem, I guess, would be to have more people get a college education. And in fact, over the last 40 years or so, the proportion of students going to college has risen quite dramatically. What's the evidence on the economic advantage of having a college degree?

David Deming:

Yeah, well, I actually saw a recent survey, I think from Pew, when you asking people, what do they think is the value of a college degree? Is it worth the investment? Those numbers are actually on the decline just in the last year. Fewer people say that a college degree is worth it. That it's a good investment. That being said, it still is. In terms of social policy investments, in terms of personal investments that a young person can make for themselves, a college degree is still a pretty good one. It's not without risk. Not everybody who gets a college degree experiences economic success. But many more do than don't. And of course, even though it's expensive and you have to pay many of the costs upfront, the benefits pay out over the course of your entire life. And it is actually true that if you look at the salary differential between somebody with a college degree and somebody without, that is pretty large in your late twenties, but it gets even larger over time.

David Deming:

And so that gap just continues to grow. And so, again, it's not without risk. And we have a problem in this country that we're asking students to take on a lot of the risks to borrow huge sums of money to go to college. And even with all that, that's even with the financial aid that we make available, it's still today, less than 40% of people aged 25 to 29 have a bachelor's degree in the U.S. today. So it is not something that the majority of young people get to achieve, unfortunately. But it is nonetheless an important ticket to the middle-class. I think that's why you see so much consternation over college costs, so much criticism of colleges. Because there's a sense that there's this prize out there that you increasingly have to have to be a member of the middle-class to achieve economic success. It's getting harder and harder for ordinary people to afford. So I think of that as a first order problem we face in this country.

Michael Klein:

So on the issue of college costs, one opportunity that many people have is to go to public colleges where the costs are lower. And this is especially true of people who are perhaps the first in their families to go to college or people coming from lower income households. One reason that public colleges can offer lower tuition is because they get public funding, but this funding has been decreasing over time, hasn't it?

David Deming:

It has. I think it's worth stepping back Michael, and just think a little bit about the college [inaudible] in the U.S. So, you see a lot of press about the kind of Harvards and Stanfords and Tufts of the world, but 80% of people go to public colleges and universities; 80% of those who go to college, go to public schools. And so, any kind of serious reform of higher education in the U.S. has to begin and end in the public sector. The thing that most people I don't think fully realized about college is that even though tuition at a state school is rising pretty fast, you're still getting a good deal. Why? Because the true cost of that education is much, much greater than the tuition you're being charged. So just to give you an example, at UMass tuition might be \$12,000 a year or \$15,000 a year, whatever it is, but actually what's being spent on your education is more like 30 or \$40,000 per year.

David Deming:

You might say, well, how do you make up that difference while students are footing 12 to \$15,000 a year of the cost, and then the rest maybe 20,000 is being paid for by the taxpayers of Massachusetts. That money goes into the state tax base and that gets distributed as legislative appropriations to public universities. And so what has happened over time is that you used to pay \$5,000 a year for a \$20,000 a year education. And now you're paying \$10,000 a year for a \$20,000 a year education. So the resource costs of higher education actually hasn't changed that much in inflation-adjusted terms, but the share of that total cost that students are paying has increased. And so that's what I mean when I say public spending on colleges has gone down and we're asking students to essentially assume more of the risk of their college education by paying the tuition upfront, rather than taxing everybody to pay for the education of a generation and spreading that risk across many of the taxpayers.

Michael Klein:

So some people might say, well, if you're earning more then you could pay more. But of course the problem with that is that as economists say, capital markets aren't perfect. You can't necessarily borrow. So you're precluded from going to an institution of higher education, because you just don't have access to the funds, even though prospectively, you could be banking more money.

David Deming:

That's right. I mean, I think there's kind of hard credit constraints. As in you just can't borrow enough money. And again, it's not just tuition. It's also the opportunity cost of going to school. So many people who go to college have families to support. They work part-time. They would like to not, they'd like to go to school full-time if they could, but they can't afford it. So those kind of softer credit constraints that are just becoming binding for more and more people. But then there's also just the kind of gulp that you feel in borrowing a hundred thousand dollars to go to college where you don't, it's not like college as a product it's not like going to the store and buying a breakfast cereal where you buy a box of cereal for \$3.

David Deming:

You try it, you like it, or don't like it. And then you get to go back and price shop and a college education's super expensive. You only do it once. And you don't really know whether you've got a good deal until after you paid, years after you paid. And even then, you're not sure. And so it just doesn't obey the kind of fundamental laws of market economics in the same way. And it's unrealistic to expect everybody to say, "Oh yeah, I just know that it's going to pay off on average. I'm going to close my eyes and hope everything works out okay and borrow \$100,000 or borrow \$50,000 even." And even that sum of money, \$20,000 is hard for many people to stomach. And so they're understandably hesitant, especially when, again, college pays off on average, but it often takes a while.

Michael Klein:

During the presidential campaign, we heard some of the candidates calling for free college. And this is a position that some politicians continue to advocate for. Wouldn't that be tremendously expensive?

David Deming:

Well, it would be expensive. But if you circumscribe it in particular ways, it's actually not as expensive as you think. So, first of all, stipulate tuition-free college means zeroing out tuition, and doing it at public colleges and universities means, you're not saying anybody can go to any private school for free. Right? The private schools have tuitions. And I don't know what Tufts is. It's going to be, you know, 50, \$60,000 a year, maybe more. Same with Harvard. That's not what anyone's talking about when they talk about free college plans. They're talking about [inaudible] tuition, which currently in public institutions averages around 8,000 to \$9,000 a year at a four-year school. And, you know, \$3-4,000 at a community college per year, taking that number down to zero. Right? And so that's a much lower cost burden than you might think, especially because many students already effectively attend for free.

David Deming:

They just don't know it until after they apply. So if you're a low-income student or even a middle income student, you qualify for a Pell grant and you go to a community college with a tuition is \$3,500 a year, and you get a \$4,000 Pell Grant. You apply, you think, "Oh, can I afford college?" And then after you apply, you make the decision to go. You make all your life plans, you get your financial aid back and you say, actually you have a Pell Grant that covers the whole thing. And so what you're getting there is you're sending people to college almost for free already, but you're not getting any of the kind of advertising value of, "Hey, listen, come to college cause you can probably get it for free." And people just don't know. And so that also means the fact that this Pell Grant already exists is that if you lower the tuition cost to zero, that's actually not a big leap for many students.

David Deming:

So I did a calculation in a New York Times Op-Ed last July zeroing out tuition. So tuition-free colleges and tuition-free enrollment at all public colleges and universities would cost about \$80 billion, under the assumption that it didn't really increase enrollment. So it might be a bit more if it got more people in the door. Maybe 90 or 100 billion dollars a year, which is a lot of money, but it's actually not that different.

It's actually a little bit less than what we currently spend in the federal government subsidizing enrollment. So if you did that, you could finance part of it by reducing expenditures on other programs like tax credits for higher education and other subsidies. And then if you just look at what we're spending on other social programs, what we're spending on national defense, what we're spending on other things it's actually not, I mean, 100 billion dollars is real money, but it's not...

Michael Klein:

100 billion here, 100 billion there, right?

David Deming:

Yeah, exactly. I mean, we just spent, what is it, \$4 trillion on a stimulus package, which is a lot more than a hundred billion a year. You could finance quite a bit of it through a combination of maybe some small tax increases on higher earners lowering tax incentives for higher education, which don't really work. Actually, they tend to just be a giveaway to people who are going to go to college anyway. And a few other things. And I discuss more details in the piece, but the point is, this is not, I think people will have an aversion to the idea. You shouldn't be able to go to college for free. And that gets in the way of hard thinking about whether it makes economic sense to do it, given how much we subsidize college already.

Michael Klein:

So going back to the issue of public colleges and the cutting of funding, cutting funding seems to affect students who are in college already because a lot of the funding is helping to keep students in college. Again, even more so first-generation students or students from low-income families. You have an Econofact memo on the problem of going to college, but then not finishing and then incurring the debt, but not having the degree to show for it. Can you describe what's been happening with unfinished college educations and the kinds of problems that presents?

David Deming:

Yeah. Sure. So just to set the context, Michael. When I think about the big problems we face with public higher education, I don't think cost is actually the main issue. I think spending is the main issue. And to just make it concrete, what does that mean? Well, if you look at a system like California system, so the Cal States, some of the UCs, the California Community Colleges, certainly, this is a state that has prioritized low tuition. So tuition is extremely low, extremely affordable at Cal States at community colleges in California, but they don't spend very much money on the system itself. And so what does that mean? It means you can enroll in the California community college system and spend 800 bucks a semester or whatever, 1,000 dollars a semester, but there are long wait lists for every course.

David Deming:

They're all taught by adjuncts. Class sizes are huge. There's little or no support, tutoring, academic services counseling. Signposts on the way to a degree. And, the programs that actually have high earnings, like nursing programs, are extremely over-subscribed. So ten applicants for every one spot, and it's very hard to get in and they have to turn many people away. Those are all consequences of low levels of spending. And those are not, like lowering the price even further doesn't solve any [of those] problems. And that's the reason why completion rates at community colleges are extremely low, 20%, 30%. And completion rates for low-income students at four-year colleges are more like 30, 35%, 40%. And so, it's true in the U.S. that more people who go to public colleges don't graduate than do graduate. So I would call that a crisis. I would say we have a college completion crisis, and we're spending a lot of money to subsidize the price of something that many people have trouble getting through.

David Deming:

And I think a big reason why they have trouble getting through it is that the programs themselves are not very well resourced. They don't provide adequate supports for students. There's not a lot of attention from faculty. They're just taking the same pool of resources and spreading it very thinly across many different students. And so to me, the way to solve this problem is to spend more money on the supply side, on the institution side, not just continually focus on lowering the price for students. Although I think that's important too. But I think the balance has shifted too far in the price reduction side right now, and not enough on the quality or spending side.

Michael Klein:

David, you mentioned community colleges and that's an alternative, perhaps a very attractive alternative for a lot of people. Can you talk a little bit more about the role community colleges might play or should play?

David Deming:

Sure. So as you probably know, as your listeners probably know, President Biden has announced a plan to support federal spending to support tuition-free community college attendance across the country. So it's very relevant. And I think it's a bit difficult to speak uniformly or with one voice about what's happening in community colleges, because the programs differ so much. Broadly speaking, Michael, there's two different things community colleges are doing. One is the transfer function. So you go to a community college, you earn an associate's degree in liberal arts or general studies, and if you do well, you can apply to transfer to a four-year school. And if that goes well, you essentially get a four-year college degree where two of the four-years were at an institution that costs a lot less. And so you can save a lot of money.

David Deming:

And some states like California have a long history of serving the transfer function. The problem is that many students are getting these degrees, don't end up going to four year colleges. They end up dropping out and they don't end up getting a degree. If they do get a degree, an associates, it's not really in anything applied. It's not something that employers are really excited about because it doesn't connect to any specific skill.

David Deming:

But if you do transfer, then it can be a very, very affordable thing for you. So that's one thing community colleges do. Second thing they do is career-oriented, more vocational programs, programs in specific areas. Some of those are extremely successful. So one of my favorite examples is a recent paper looking at nursing programs in California. I mentioned this earlier. Because they're so oversubscribed, Michel Grosz, who wrote a paper in the AJ Policy a couple of years ago, where he looked at these lotteries for nursing programs and found that people who got a lucky lottery number and got to enroll in the nursing program had 40% higher earnings, five years later, than people who got an unlucky lottery number.

David Deming:

And that tells you two things. One is this program really pays off. And two is it's crazy that we can't fund more people to get through it, right? It's crazy that the research design enabled us to compare the one person who won the lucky lottery to the nine people who didn't. And so what we should really do is be funding these programs at higher rates so we can produce more nurses because healthcare is a growth industry. And so I think there are pockets of really successful programs and community colleges that are career-focused that we should be seeking to emulate.

Michael Klein:

Pivoting a little bit, David, these kinds of technical skills, skills that you learn in college and so on, are certainly very important. But you discuss in another Econofact memo that automation, which we talked about in the context of manufacturing earlier on, it's not just affecting manufacturing, but also more highly skilled jobs as well. But computers aren't people and social skills are important for a very wide range of jobs. In what types of jobs are social skills especially important? And what's happening with the number of those jobs and the pay that's offered in those jobs.

David Deming:

Yeah. Michael, so you bring up an area that's been of interest to me for a long time, which is future of work kind of issues. And the way I like to think about this is that if you are seeking to not be replaced by machines, or by a robot, or by an algorithm in your job, you want to look for things that people are naturally good at and machines are naturally not so good at, right? So complex computations; we don't really have an advantage over the machines. That's a trivial, machines through brute force can solve a game like chess, where the board space is finite.

David Deming:

And like you just kind of work through many different moves and combinations and pick the best one. That's something that's trivially easy for an algorithm, but it's hard for people. We think about like being good at calculus or being good at competitions in your head as being some kind of sign of intelligence, but it's actually pretty easy for machines.

David Deming:

On the flip side, you and I having a unstructured conversation, like a semi-structured conversation, like the one we're having, it's very natural for most people. People differ in their ability to do it, but it's natural for all of us to have a two-minute unstructured conversation with another human being. But it turns out to be extremely hard to program an algorithm to do that same thing. So if I replace me here with algorithmic David Deming, I think--I would hope that the conversation that algorithmic David Deming is having with Michael Klein would be much worse.

Michael Klein:

I want to let our listeners know, in fact, it's the real David Deming, not the algorithmic David Deming, that I'm talking to.

David Deming:

Yeah. If I was able to program a chat bot or an AI program to speak like I'm just speaking, I could make billions of dollars off of it. People are trying really hard and they can't do it. And the reason is because the problem space is infinite, almost infinite. Like I can say anything in response to you and you can say anything back. And so it's just very hard to emulate that. And so that's the kind of skill that is going to become more valuable because for many workplace processes, you still need to communicate, you still need to get on the same page about things you need to work in a team. And, you're not going to replace that with automation any time soon.

David Deming:

And so the premium place on that skill just goes up and up and up. And that's what some of my work shows systematically looking at patterns of employment, wage growth in the U.S. and other countries over the past few decades shows that jobs that require teamwork and social interaction or paying

relatively higher wages. They're becoming a larger and larger share of all the jobs in the U.S. economy. And I expect that trend to continue.

Michael Klein:

What would you give as an example to our listeners of jobs that are sort of paradigms of that?

David Deming:

Yeah. So the jobs that are really growing the fastest are jobs that require a college degree, are analytically intensive, but also require teamwork. So it'd be things like managers, consultants, economists, college professors are two categories actually in the data that look pretty good. I know that's self-serving, but it's still true. Healthcare jobs, anything in business tends to be pretty team-intensive, teachers. These are all jobs that are hard to automate.

David Deming:

And then jobs actually that are not growing so fast, are any STEM type job it's not computer related. So engineering actually has shrunk as a share of all jobs in the U.S. economy over the past decade. Plus even jobs that are quite mathematically intensive, but do not require teamwork, are not growing as fast. And of course in the blue collar realm, it's jobs like manufacturing. We see the same things because if, we're getting to the point where you can design a machine to do any one thing better than a person. But what people can do is be flexible and communicate with each other and make decisions and kind of operate an open-ended unstructured environments.

David Deming:

And so that's really the underlying thing that's driving changes in the composition of good jobs. And I think that'll continue to be true for the foreseeable future.

Michael Klein:

David, just to close, we've been talking about education as offering a ladder for people to better their economic situations. And as I mentioned in the introduction, you're a co-principal in the CLIMB Initiative, C-L-I-M-B. Can you speak a little bit about that effort, what it does, what it hopes to achieve and what do you see as its successes so far?

David Deming:

Sure. So at CLIMB, so this is a joint work with Raj Chetty, my colleague at Harvard and John Friedman at Brown. And what we've done is built a network of more than 400 colleges and universities where we help them analyze their own data and design policies that do two things. One is increase the representation of low-income students at U.S. colleges, and then increase success rates for those students. So make sure that once you admit more of them or attract them to your campus, that you get them into careers, make them upwardly mobile, get them to graduate, get them into good paying jobs. And that's really the point of the CLIMB Initiative, through research in partnership with these institutions, to increase the contribution of U.S. colleges to upward mobility, upward economic mobility.

David Deming:

And so we, for example, using our kind of big data approach, we're looking across our partner colleges to see which ones are particularly successful with low-income students, which ones have particularly high

graduation rates. Is that connected to certain policies they implement? Maybe their support programs for first gen or low-income college students.

David Deming:

Maybe they are specific connections with employers in your labor market. We don't know the answer yet. That's something we're still working on, but basically to think about CLIMB as a research and learning network of partner institutions who are all united around this important goal of college as a lever for economic mobility.

Michael Klein:

Well, that's really important. It's great that you and others are working on this and using your skills as researchers and economists to really better the lives of people. So, David, thank you very much for talking with me this morning about this very important issue of education and jobs. It has a lot of implications for the economy and for the chances that people have to better their circumstances.

David Deming:

It was a pleasure to be with you, Michael. Thanks for having me.

Michael Klein:

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