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WEBINAR

AUTOMATION, TRAINING, AND THE MIDDLE CLASS

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P R O C E E D I N G S

MR. CASEY: Hi, welcome to the event "Automation, Training, and the Middle Class" hosted by the Future of the Middle Class Initiative here at Brookings. This is the third such event where we've sort of focused on having a conversation on various aspects related to middle class mobility and how automation affects job markets and the lives of the workers who might be affected.

Today, we're going to have three panel discussions on various aspects of this issue. The first one will focus on the role of community colleges in both training the future middle class entrants potentially, and also reskilling potentially displaced workers after they've been displaced from their jobs. The second panel will focus more on public, private partnerships and how public policy can support reskilling of these potentially displaced workers. And the final panel, which will be moderated by my colleague Richard Reeves, will focus on something a little more exigent that's affected all of us. It's the role of COVID-19 in affecting jobs.

As some of the concerns that have been raised and when we look at our current high unemployment rate, are any of these jobs coming back? And it's possible that COVID-19 might accelerate ongoing processes to move towards automation and artificial intelligence. And so, we want to have a discussion on that.

So, before we get started, I just want to thank Sarah Natzel (phonetic), Hannah Van Drie, and Anna Dawson for putting this together for us. And I wanted to introduce our first paper and our panelists. Our first paper will be presented by Riley Acton who is a new associate -- assistant professor at Miami University. And she will be joined after her talk on the panel by Scott Ralls, the president of

Wake Tech Community College System in Wake County North Carolina. And Lauren Pellegrino, senior research associate at the Community College Research Project at Columbia University's Teacher College. Riley, if you want to take it away? Thank you.

MS. ACTON: Yeah, thanks, Marcus. I'm just going to share my screen here. Okay. All right, well, thanks for tuning in everybody. I'm excited to be here today to talk about community college program choices in the wake of local job losses. Just before I dive in, kind of usual disclaimer. This project uses data from the State of Michigan, their Department of Education, so they've approved these results to share, but anything that I say today does not necessarily reflect the views of that agency or their employees.

So, hopefully this topic doesn't need a lot of motivation for the folks that are joining us today. I think we all come from a place of understanding that community colleges play a really large role in higher education in the United States enrolling somewhere between 30 and 40 percent of college students, disproportionately low income students, and students of color. And we also know that community colleges can play a really large role in terms of workforce development policy and in terms of developing a labor market in their local economies.

Now, one thing that we know as well thanks to really the expansion of a lot of state data systems that link up education records with employment records, is that the returns to a community college education in terms of how students fair in the labor market can really vary depending on what types of programs students complete. So, one of the examples that you see cited quite a bit is that healthcare programs, registered nursing, as well as other types of healthcare technician programs, seem to prepare students really well for in-demand careers. And it seems pretty consistent across different settings and different groups of students. But, of course, not every program necessarily has these same results.

And in contrast to the four-year college sector where there has been a lot of empirical work for a long time now on trying to understand how students decide what to major in, how students sort into different types of fields of study, we really do not know quite as much at a community college level about how students choose what programs they would like to go into and how these choices in particular relate to the labor market.

So, in this paper, I study how students respond to negative economic events in their community, specifically focusing on how that affects fair enrollment choice in community college, as well as what program they choose to pursue. And now empirically what I do -- I won't go into all the details here. I won't have any equations or Greek letters, but just as a broad overview of what's going on here, is I'm going to be exploiting variation from mass layoffs and plant closings in the State of Michigan.

These are different types of events that are reported to Michigan's WARN System. WARN is one of my now favorite acronyms, the Worker Adjustment and Retraining Notification Act, which is a federal mandate that requires that if employers have mass layoffs or plant closings that meet certain criteria, they have to report those to their state labor market agency.

So, I have a listing of all mass layoffs and plant closings that were reported in Michigan over about the last 20 years. And then what I do that's new in this paper is I match those events to industries. So, I can see General Motors, that's a very different industry than a hospital, as an example. And then I rely on the fact that different occupations are concentrated in different industries that estimate students' exposure to negative economic events in different occupations and, therefore, potentially affecting their preferences among different fields of study.

So, the intuition here is fairly straightforward. If General Motors has a plant close or has a mass layoff, that's probably not going to be affecting healthcare professions very much. But if a hospital closes, that probably is going to be affecting the healthcare field.

And I look at these different types of events in six different fields of study: business, health, the skilled trades, STEM, law enforcement, and then a miscellaneous catchall category. And I link these labor market data up with postsecondary enrollment data from the Michigan Department of Education in order to track how recent high school graduates respond to these events in terms of their postsecondary choices.

Really what I'm asking here is are students less likely to enter particular types of programs when related jobs in their communities experience some sort of negative employment shock? And the other thing I'm going to be asking is that if this is the case that students are less likely to go into healthcare programs when a local hospital closes, as an example, what do they do instead? Is this really deterring them from entering postsecondary education overall, or it is adjusting what programs they go into, or is it maybe even inducing them to attend four-year colleges instead? What are the substitution patterns that are happening here?

And as an overview of my results, I find that, yes, indeed students are less likely to enter particular programs when related occupations have experienced job losses in their communities. Students are most responsive to those layoffs, those job losses that occur in their senior year in the county in which they reside during high school. So, it does seem like there's a certain amount of salience that is important in determining how students respond to the economy around them. They are not particularly responsive to layoffs that occur in their sophomore or junior years of high school or to those that occur a few counties away. Suggesting perhaps that there's a need for more information or more guidance for these students as they're making choices.

And in terms of the magnitude of these results, on average I find that one additional layoff per 10,000 adults in a county reduces enrollment in related programs the following year by a little under 1 percent. But this is a fairly small estimate in terms of the magnitude. Perhaps an easier way to think about is kind of what happens if there's a larger event. So, I find that a one standard deviation increase in layoff exposure during the senior year of high school reduces enrollment in related programs the following year by closer to about 4 percent.

Now, I do not find much affect on overall enrollment in these career and technical type programs of students coming out of high school. Suggesting that students are shifting their enrollment between different fields of study. They're not foregoing going to college or particularly going into the community college sector overall, but they are changing what types of programs they enter.

And in the second half of the paper, I look at this exclusively by estimating how job losses in each of the different groups of occupations that I'm studying affect enrollment in each of the corresponding program groups. So, thinking about how do layoffs in healthcare occupations affect enrollment in law enforcement programs as an example.

And I find some substitution effects here. And what I really dig into is how student substitution between different types of programs lines up with the skills and the characteristics of the occupations that students might be training to enter if they were to go into these different types of programs. And I'm able to do this by using different measures of occupational skills from the Department of Labor's O*NET database, which I think many on this call would probably be familiar with, but provides a wealth of information about the characteristics of different occupations.

So, essentially, what I do is I create measures of how similar skills are between different occupations and therefore between different types of programs at the community college level, and I find some suggestive evidence that students are more likely to substitute towards programs whose occupations require similar skills. So, it does not seem to be the case that students are exposed to some sort of negative employment shock in one field and decide they're going to do a total 180 and go into something else. They seem to shift between things and look at least on paper somewhat similar. As to one of the examples of those results that I find is that when there is an increase in job losses in the healthcare field, you see fewer students going into healthcare programs, but you see an increase in enrollment in other social service programs, particularly, childcare is one example.

Now, in terms of the policy implications from these results, I think there's a couple different kind of broad takeaways and directions to go. One that I hope is informative to people actually on the ground at community colleges is that colleges should be prepared for students' choices of programs to potentially change when the local economy is changing. And I think there's lots of different ways you could think about colleges helping students when these sorts of negative economic events occur around them.

Perhaps you invest more in additional counseling and advising for students who previously thought they were going to go into one field and are now changing their minds and wanting to go into something else. I think one potentially really important avenue is to help colleges be able to develop programs that fit their local economy as their local economy changes over time. Of course, we are all facing budget constraints right now that might make that difficult, but I think that's a potentially useful area to be thinking about future policy. And, of course, another thing related to that is having colleges in partnership with local employers trying to have real time information about what local employers are needing in terms of occupations and skills for students to develop.

At an even larger level going beyond the community college sector just to think about education choices as a whole, I think high schools, colleges, communities, et cetera, should continue to think about what sorts of information students have about the labor market and what sorts of information they then provide on (inaudible) having to do with students (inaudible).

So, what is the relevant labor market for students in terms of geography? I think it's something we don't have a great grasp on and how does that vary across different demographic groups of students? One thing that I find in my paper is that students are really sensitive to what's happening right around them. And that could suggest some sort of lack of information about a broader context that maybe high school guidance counselors or folks at the community colleges could be helpful in providing information to students. But it could also be that students are really acting quite reasonably if they have geographic constraints or preferences that are really keeping them in a local area. So, trying to determine what students' geography preferences and constraints are and fitting information to those I think could be potentially important as well.

So, to wrap up here, just again, overall findings. Local labor market shocks appear to deter students from enrolling in closely related community college programs. This is not because students no longer attend college. If anything, we know that when local economies worsen, we see increases in college enrollment. But we do see a shifting of students into other types of programs, particularly those that seem similar across some skill dimensions.

Now, one limitation of these results is really a limitation driven by the data that I have access to right now is that I am only considering the choices of students coming right out of high school and enrolling in college for the first time. Of course, I think it is very important to study the choices of students further out of high school, older adults, particularly in the current moment that we are in if we are expecting an increase in older students enrolling in higher education and community colleges. Particularly, I think thinking about how do displaced workers decide to reenroll or enroll for the first time in higher education. And how do the skills that they've developed in their career thus far translate into the types of programs they enter is a really important question and an important line of future research.

And, of course, as I think we will have some of our panelists discuss later, thinking about how something as broad as the current moment we are in in terms of the COVID pandemic in ensuing economic downturn, how is this going to affect the types of fields. The fields of study students might want to enter, and how that varies across age and demographics. And, of course, something we'll be following I think for quite some time now. So, I will wrap up there and turn it over to Lauren and Scott.

MR. CASEY: Thank you, Riley, for that. Scott and Lauren, we will be interested in hearing your remarks. Scott?

MR. RALLS: I appreciate this. Well, Riley's paper kind of harkened me back to some conversations or memories from almost 20 years ago with a interaction with a major employer. I've been a community college president at three local community colleges, as well as the North Carolina Community College System. This one goes back almost 20 years ago when I was president of a smaller college that we were having conversations with an employer who was a manufacturer of a luxury item and had really cyclical demand in that regard. And responded through its employment whereby within a matter of every three or four years it seemed like they were very much ramping up employment and then ramping back down and ramping back up and ramping back down. The conversations we were having were why could they not get students into the short-term training programs that they needed for that? Why would the college not, you know, reenact a specific degree?

And the challenge was that, you know, students and actually I think there is communities have memories for these things. There's a community awareness. So, you know, sometimes it's not as -- it's based on just conversational. It's not so much based on data. But whenever there is a significant employment event, it creates a lingering memory. Particularly in communities that are smaller in that regard. And that's something that we saw. So, students, you know, while students were looking for jobs, there was a lingering sense of, well, are those jobs stable? Are they going to be there? And so that was a challenge. And we've seen that in many cases in community college. So, I think that rings true with Riley's paper.

One thing I would say real quickly about, you know, looking at community colleges and looking as we move forward, I often say that community colleges are through colleges. We're not to colleges. And what I mean by that is, you know, if you take the college where I am now, Wake Tech, if I went out and surveyed middle school students throughout Wake County and Raleigh right now, probably very few of the percentage would say I'm going to Wake Tech someday. They have other aspirations. But at the end of the day, 25 percent of all the graduates in our county come to us. But they come through us primarily not to come to us, but to either go first step to a university for many of those students, or to go into our applied programs or, as Riley's paper notes, our vocational programs.

And as she was talking about those areas, one of the things if you look at the students who go into what she was referring to as vocational community college programs, what we might call applied associate or certificate type programs, those students, as was noted in Michigan, you know, they are more likely to be lower socioeconomic, more likely to be male, I think that she noted. But I've also found that the age differences are quite different between students who are pursuing what we might call university transfer degrees and those that are pursuing more skill-based degrees.

In fact, here at Wake Tech today there's a five-year difference in the average age. The average age for our applied vocational degrees is 28. The average age for our university transfer is 23. I think there's also a difference in focus with students in that regard. Students who are younger, the high school students, typically find that perhaps their focus is a little more lifetime career. They often think about what's the degree path. Sometimes they will not limit themselves to what might be a terminal two-year degree. Adults, which are more likely the students who percentagewise typically will go into our applied degree, they're very skill focused. Because they're often thinking about not so much what's their lifetime career, but what's their lifeboat job. They're looking for that next thing. They're thinking very much in that regard.

So, I think that while I know Riley's paper could only look at seniors in high school, I bet if you applied it to all our applied students, our skill-focused students in that regard, you would probably even find a greater impact by the types of impacts of plant closings or job loss in that regard. Because they're tuned to that more so I think than the younger students in that regard.

One thing I just would comment on real quickly before turning it over to Lauren. Is I think that something that we'll see coming out of this recession, I think back to the last big economic event. I used to joke and say I became president of the North Carolina Community College System on the day the great recession started in 2008. And within a matter of three years, our enrollment had grown by 28 percent. I mean, we're likely to see students just pouring into us as a result of this economic impact.

As we moved into this though, there was a lot of conversation that you'll often hear about skills versus degrees. You know, we've now moved within three months from one of the best job markets ever, or toughest job markets if you're an employer, to now what is, you know, completely different scenario within three months.

Heading into this event, which we're still very much in the early stages I think of the economic impact, you know, there was a lot of talk about skills versus degrees. I had lots of employers who would say to me we don't care about degrees. We only care about skills. But I would often find that sometimes that conversation was coming more from CEOs, executives, production managers. When you talk to human resources folks, they still cared about degrees. And so sometimes you'll see this dichotomy between skills versus degrees. I think as we come out of the pandemic, that's even going to be ramped up a little bit because like we saw in the great recession, you're going to see more people with advanced degrees pursuing jobs that wouldn't need typically that type of degree, or competing some more with students who are coming out of certificate, certifications, or other programs. And I think though all students are going to need more skill to get that first job.

So, I think there is this dichotomy, false dichotomy that some signs set up between skills versus degrees. And I think in the degrees that we're talking about with Riley, one of the things that we need to be aware of is how do we create progression? Because that first job often requires skills and that may be a certificate that comes into an associate degree. In Camden we transfer to a bachelor's degree from that. That's a more difficult thing, but that's something that we have to think about. I think that's also why coming out of the last recession we saw a growth in community college bachelor degrees because of this issue.

So, I think that's a dynamic we need to pay attention to as we look at this. And I think that, you know, certainly the impacts of this recession are going to -- we're still just now seeing the early aspects. So, we see a lot of healthcare decline right now, but I think you'll see that be right back up. Over time, will we see more construction and manufacturing as consumer demands? So, a lot to be seen in terms of what's going to happen. But I predict that just like in the last recession, the road to recovery in the United States is going to run right through the middle of America's community colleges.

MR. CASEY: Thank you, Scott. Lauren, your comments, please?

MS. PELLEGRINO: Thank, Marcus. Yeah, thanks, Scott. I just want to underscore some of the things that Dr. Ralls talked about. I think, you know, CCRC, Community College Research Center has partnered with MIT and we're in a year now into a project called Emerging Technologies and the Future of Work. And what we've done is we've gone out and we've talked to community colleges across the country about how they are thinking about these issues, this emerging sort new era, but also, you know, what are the things that they are doing?

And what we learned is that these institutions are heavily involved in their communities and their regions and with employers. And I don't just mean keeping an ear to the ground or getting some outdated labor market data. They're having meetings. They're convening employers on campus. They're talking with them on a daily basis. They're making curricular changes based on recommendations from employers. So, they're really, really in tune with what's happening with the employment landscape in their communities and it's a major effort. It's a big lift. It's everyone from the president. I know Dr. Ralls is always often, you know, working with employers on a daily basis all to the way to faculty and beyond.

So, you know, the institutions are heavily committed to understanding and being responsive to the changes in their labor market. But again, that's a very resource intensive effort and, you know, we've been really impressed to see the extent to which these institutions are on a daily basis out working with employers to try and be responsive adding programs, talking about credentials, talking about skills, holding their feet to the fire when they talk about things like we don't care about, you know, credentials. We just care about skills. And then, you know, calling them out when they actually do care about credentials. Things like that.

So, making sure that, you know, that there's accountability. Also, these colleges are creating these pipelines for students to engage with employers while they're students. So that, you know, so that they can start to develop those relationships, develop the skills that employers are claiming that they're having a hard time finding, including, you know, technical. But also nontechnical skills. So, there's just a really strong working relationship between community colleges and their local labor market and we were certainly very impressed with that.

The other thing that kind of comes to mind, and Riley to your point, to your suggestion, I think is really good, is that what institutions are doing and we're learning this both through future work, but also through some of our guided pathways in student services work is that colleges are reaching out to students very, very early. So, you know, as soon as they apply they're getting a phone call within, you know, two days from somebody at the institution to talk with them about, you know, their program choice, about what their career options are. Because you're right, Dr. Ralls, to your point younger students sometimes don't tend to -- they might not know what all the career options are associated with a certain program. A returning adult might have a better idea of that, but they may need more support on things like, you know, becoming a student again after many years of not being a student.

So, you know, so there's a lot of really early counseling that colleges are doing through onboarding. Even high school outreach, there's a ton of high school outreach that community colleges do as well to try to make sure that, you know, for those students, those seniors who might be experiencing some disruptions in the labor market are seeing that that they can help interpret that and help them connect that to their next move.

So, the other thing too is, lastly, is that, you know, I have done a little bit of qualitative work in terms of talking with students about their major choice. And, you know, there's so many things that go into those decisions. A lot of it is, you know, peers and family are highly influential for students in terms of how they choose their major. And then to your point, Riley, as well is that sometimes it's something they want to do. They want to be in a helping profession. You know, they want to be in a people facing profession, whatever that might be. And so, trying to help them sort through, you know, because community colleges often have over 100 programs to chose from. It can get very overwhelming. You know, you think about sort of the tyranny of choice, right? And how stressful that can be. So, there's a lot of effort on the part of colleges to really help students sort through that. Help them make decisions with as much information as they possibly can.

So, and then just lastly on the kind of the COVID note. I do want to say that, you know, community colleges are excellent at crisis management. They have been doing this for a very long time. They do it during recessions. They've been managing crisis of poverty in their communities for a very long time. So, I think just to underscore what Dr. Ralls said earlier is I think if there's any entity that is poised to help support communities getting back on their feet after this, it's community colleges. So, thank you so much, Dr. Acton, for your work on this and for spotlighting community colleges. We're always happy to see that.

MR. CASEY: Having trouble unmuting. Thanks to both of you for those comments. This is a really interesting topic and one that as, you know, a university professor, I should be much more attuned to and I haven’t been to this point. So, you guys have really put this on my -- in front of my face as something to think about.

So, for the audience and everyone here, we're going to begin the moderated question part of this. So, if you have any questions, please submit them and I'll get them.

I wanted to begin with my own questions for all three of you. And the first question that I'll pose to all three, and each of you can give your response to this. Is in what ways do you think that public policy, whether at the national level or at the state and local level can actually help sort of foster some of this flexibility to respond to these local shocks? Because, I mean, what's clear from Riley's paper is that -- and from both Scott and Lauren's discussion, is that people are paying attention. And people are responding to this information. So, in what ways can public policy actually support this flexibility to be able to provide the programs that these students need to adjust both, you know, new entrance into school just out of high school, but also thinking about potentially displaced workers? Riley, you can begin.

MS. ACTON: Yeah, I mean, I think the first thing that comes to mind for me is funding, right? So, in order to be flexible and in order to develop new programs, it takes substantial resources to be able to do that. And if you're particularly trying to do that quickly and as kind of Lauren mentioned, in a crisis situation, that's probably going to take even more resources. And, of course, this is hard, right? Because at the same time when economic shocks are happening, that's also when you have state and local budgets getting really tight, but trying to figure out ways to reallocate funding towards developing new programs or enhancing programs that already exist. Something that kind of is triggered by some sort of local economic event seems like the ideal thing that we would be able to have. Yeah, I don't know if Lauren and Scott have anything to add on that.

MR. RALLS: I'll double down on what she just said. And I know sometimes it's just assumed that someone would say funding. But I think it's something that we really have to talk about in this regard. You know, high demand careers, programs that train and educate students for high demand careers are often high cost. You know, the instructors are instructors who can demand more on the market. The equipment is often very expensive. And oftentimes, the class sizes are limited because you're working around a very expensive piece of equipment. You have a nursing program where you may have, you know, limitations on a clinical side. They're very expensive for colleges like us to offer. But they're also ones that'll lead to the best jobs.

I also believe that, you know, and I've said this many times before, but I still believe this very much is that the greatest difference in rhetoric to investment is truly technical education. I mean, everybody's in favor of it. Everybody talks about how important it is. Check out where the investments go. Are they really going to technical education? So, I think understand the cost, understand the impact and the opportunity, but also look to see where the investment's going and typically there's a lot of rhetoric, but there's not that much investment.

MS. PELLEGRINO: Yeah, and I mean, you know, I won't beat the funding horse because I think that's very true. I think the other thing too is that, you know, I think, you know, one of the challenges that we saw that colleges had in our work is that, you know, to be responsive, right, to employer changes and needs, there's a whole lot of hoops that you have to jump through in order to do that, right? You have creditors. You might have to get something approved at the state level so that it can be offered across the state. Like, you know, a new program. So, you want to offer a new program at an institution. You may have to get that approved at the state level because in theory that has to be offered at all the institutions.

And those, I mean, we hear sometimes that that can take years. So, you know, and communities don't have years. Students don't have years. Colleges don't have years. So, a way to remove the barriers, the red tape, and enable colleges to get high quality programs up and running quickly and, you know, and in conjunction with their employers, and also facilitating ways for colleges to engage very early on with potentially new employers in their community or major evolutions that are taking place in those areas, so.

MR. CASEY: Yeah, I think to me it seems important that, and this was going to be sort of the follow-up question I had to this discussion about funding, is how do you foster these public/private partnerships to ensure that the programs that you guys are bringing forward both respond to student needs, but also employer needs as well? Because students often, you know, there are a lot of information sources as Riley has pointed out that they could get both local and outside of their local area. But given that many of the students are at least initially geographically constrained, there's got to be ways in which we could foster some public/private partnerships to ensure that hidden gems, places where there are vacancies and not necessarily clear to the students, are being highlighted too when students are coming to the community colleges to receive that training. Could you comment on that, either Scott or

Lauren?

MR. RALLS: Well, I think those partnerships are key to who we are. Primarily because our goal really, as I said with through colleges, is they'll help students achieve their aspirations and for so many of our students, their aspiration is an economic aspiration. It's to better themselves and their family. So, while we do workforce development, while we do employer partnerships, it's about helping meet those goals for our students in that regard. It also then derives how they define our programs.

And so, you know, and also you can see the difference in the types of programs that Riley was discussing. The, you know, the what she called the vocational programs, I kind of stay away from that word because that's a word that our students will run. If we call something vocational, they will not sign up for it. You know, so, we have to look for certain words. But, you know, those kind of applied skill based programs are very skill-based. You know, they may have in our case, 15 hours of general education credit, but the rest are skills that are defined by employers.

And then the challenge for those students though is they typically don't transfer beyond us. So, we have to look out and that's one of the things we do a lot is we spend a lot of time scoping out strategic partners where are students can transfer. Because it's the skills that get them the job. It's those technical skills. But a lot of times to be a supervisor in their role, they have to go beyond us and get a bachelor's degree. You don't know that they necessarily need that to be a supervisor, but when you look at the job postings, they often require that. And so, that's why, you know, we have to pay attention to this mix of skills and degrees in that regard.

MS. PELLEGRINO: Yeah, and I'll just briefly add, I think, you know, like I said, one of the things we're seeing colleges really see to try to scale up are these work based learning opportunities for students. And that's part of that partnership, right? Is connecting students with opportunities to do internships, to do co-ops, apprenticeships, you know, various job shadowing even to try and get students engaging with employers. And that creates that. That helps foster and solidify those partnerships as well to have students, you know, engaging with those organizations. So, (inaudible) --

MR. RALLS: If I --

MS. PELLEGRINO: I'm sorry?

MR. RALLS: I was going to say I was going to follow-up on something, Lauren, with that. Because I think that's one of the things I really worry about coming out of this economic crisis is one of the things we're already starting to see is companies retract, you know, their work based learning opportunities for our students are going away. And for our students coming from lower socioeconomic backgrounds typically those opportunities in many cases are ways for them to get around a typical hiring process. The ability to have that opportunity in college to be able to earn money to do that. I mean, they can't do free internships because of who they are and so I do worry coming out the other side that work based learning is so important to community college students, but it is going to be the real challenge moving forward because of the economic crisis. So, that's something I worry a great deal about.

MS. PELLEGRINO: So do I. And I just want to quickly add that the other benefit to work based learning is that believe it or not, there are still, you know, CEOs and organizations out there who don't think of a two-year college as really a place where they want to get graduates, where they want to have employees come from. And by connecting students directly, they can see firsthand how talented and skilled these students are and the really, really high quality education they're receiving. It's unfortunate if that kind of gets scaled back.

MR. CASEY: Yeah, that's unfortunate because, you know, we want to focus on skills, not necessarily credentials.

Riley, a question came in from the audience just asking about your analysis. Which they're asking did you actually do an analysis of which subfields did you find the biggest demand supply gap? For example, that, you know, there are a lot of information technology jobs perhaps that are going unfilled and that people aren't necessarily responding to them or maybe even more so. Did you investigate any of that sort of analysis?

MS. ACTON: In this project, you know, I explicitly try to calculate gaps in demand and supply. I have done a little bit of work trying to break up the categories that I have. I'm currently in the paper into, you know, more detailed, finer categories. It gets a little tricky with the labor market data that

I'm using because I just have the name of a firm and from that I'm inferring the industry and the industry inferring the types of jobs that it's affecting. So, it does get a little bit tricky.

I think I -- in that question they were asking about the IT sector in particular. And that's actually one area that makes up the majority of the STEM category in my analysis. Which is a little different. A lot of times when I present this paper I try to point out like what we think of as STEM at the four-year college level and what we think of as STEM at the two-year college level can differ a little bit in terms of what programs are there. And STEM is actually an area where I don't see much affects of local labor market shocks on students' choices. Which could suggest that there's some sort of heterogeneity in terms of, you know, maybe particular types of jobs are being affected, but other ones are still in high demand. Or students are just able to interpret those as kind of temporary shocks in the labor market rather than longer on trends because I think a lot of us no matter kind of how much you're looking at labor market data, think, oh, technology is something that's continuing to be a big part of work in this day and age.

MR. CASEY: Thank you. Did you, Lauren or Scott, do you have any comments to add on sort of information technology or the subfields where you see the biggest demand or lack of demand relative to what employers are demanding?

MS. PELLEGRINO: I'll actually let Scott directly answer that. But I did just want to jump in quickly going back to the policy conversation earlier is just to add on to what Riley was just saying. Labor market data has been just really an elusive thing for institutions to get and to find reliable to make decisions. I mean it's another reason why they have to hit the streets literally to go talk with people and get that information because it's so difficult. It's hard for them to keep track of graduates. They don't have the internal resources to be able to do those things. So, you know, anything that could help make that data easier to get a hold of I think would be beneficial.

MR. RALLS: And just echoing that I'd say we do have a new tool in our toolkit I think. You know, with big data now. And that is the ability to really scrub job postings since they're all online. And so we, you know, in the past we would have been dependent on labor market information that has a time lag. And sometimes won't capture this information. Now we can very much within the last three months tell what's happened, you know, in terms of job postings and what that means in a very current basis. And I think we can all do a better job on the frontend of relaying that information to our students. We found at a college where I was previously that it's when students have that information, it really does influence their choice of major. And so I do think there's a better job for to do in all of that.

I think also when we look at, you know, the issues about layoffs in that regard, I think probably they have, you know, more impact in smaller areas than they do metropolitan areas because they get sort of washed out a little bit in a metropolitan area. I think also in some areas, you know, the way the WARN notification works is that, you know, if you're a big manufacturer and you're going to close, you're going to have to give it a WARN notification. If you're in business or others, then you can kind of get around that, you know, in terms of what that means.

So, you know, I think big layoffs we saw a lot of impact of that from manufacturing losses previously. But then those layoffs sort of factor in because now even in North Carolina where manufacturing is now biotechnology process manufacturing, very advanced types of manufacturing, there's still a hangover effect of textile jobs. Other types of jobs that were, you know, it's almost like a completely different thing even though it's the same sector. So, you know, it's --there are lingering affects to what happens in terms of layoffs in that regard in different parts of the country.

MR. CASEY: Okay, great. This was a great discussion. So, we're going to move to our next panel. I want to thank Riley Acton again for presenting that interesting paper. And Scott Ralls and Lauren Pellegrino's interesting comments on this issue.

We're going to move next to our panel, which is going to be focused on assessing the actual state based policy to support retraining of workers. We'll have Annelies Goger, who's a David M. Rubenstein fellow here at Brookings in Metro. And she'll be presenting her paper on evaluating a policy in California. And then as a part of our panel, we'll have Melanie Zaber who is an associate economist at RAND, and a specialist in workforce development. As well as Joel Branch who's currently vice president of AI Development at, is it Lucd? Lucd? Our --

MR. BRANCH: Lucd, yeah.

MR. CASEY: Apologies. I apologize for that. Thanks for the clarification. Which is an actual company that's focused on developing AI that complements humans, human workers. So, let's begin. Annelies or her co-author Marian Negoita. I don't know which one of you is planning to present, but you guys can take it away. And then we'll have a panel and moderate questions afterwards. Thank you.

MS. GOGER: Thank you so much, Marcus. And it's a real pleasure to be on this panel and a great conversation. So, before I came to Brookings for the Rubenstein fellowship, I worked at Social Policy Research Associates. And so what we're going to present today is from a project that I led there with the California Employment Training Panel. And Dr. Marian Negoita was one of my colleagues that worked closely with me on this project, which was a mixed method study.

So, the California Employment Training Panel is a state program that reimburses employers for training their workers. It was created in the '80s as the response to the globalization pressures as a strategy for retaining jobs in the state and retaining competitiveness of the companies that were in California. And every so often, there's a piece in legislation that says they should evaluate the program to see how it could be updated and improved. And so that's why we did this assessment through Social Policy Research Associates.

So, I'm going to hand it off now to Dr. Negoita to kind of start the presentation. I think he's on mute though, maybe.

MR. NEGOITA: Yeah, sorry. I wasn't able to unmute for some reason. Hi everyone. I'm happy to be here. And so just briefly what is the case for public funding in worker training?

So, the easy answer, the simple answer is that there appear to be market failures in this area because employers have been complaining for many years that they do not find typically or sometimes find the kinds of people with the kinds of skills that they need. On the other hand, you have individual workers who would like to retrain, but sometimes it's costly and they cannot afford it. And some other times, it's really hard to know what other options that they have. There's too many options, they cannot really decide.

Also, we know from the literature that employers typically underinvest in training because they are afraid that their employees may be getting poached by other companies or because high turnover or a combination of these things. And so that is really in a nutshell why, you know, public spending it's a typical case of public spending is needed where there's a market failure. And with that I'm going to turn it over to Annelies to talk about the methodology.

MS. GOGER: So, very briefly, this was a multi-component study that was mixed method. We had interviews with stakeholders, employers, staff, and we gathered program data and analyzed it. We also developed and deployed an employer survey and received about 600 responses. Those are employers that participated in ETP. And then what we're going to focus on most though is the impact study where we compared employers that got the ETP funding for training with those who were similar, had similar characteristics who did not receive the funding.

So, the key findings that we had -- sorry, I guess people aren't able to see the presentation. There, let me try screen sharing again. It's hard to do a screenshare with multiple presenters I'm learning.

So, the key findings that we had, one is just how employers talked about the benefits of this program. So, one of the things that many employers said is that the funding helped them formalize internal career advancement structures and learning management systems that before were a little bit more haphazard. So, it helped to kind of ingrain more of a culture of learning.

We also heard a lot about how the access to the funding was cumbersome and administratively challenging. And so to the extent that many employers hired consultants that were expert in the rules and the process to figure out how to access the funds without spending quite a lot of time getting through the process, which can also become a barrier to entry, which we'll talk a little bit about later when it comes to very small firms. Although I should say that many of them noted that it's getting a little bit better in recent years.

The needs that they talked about the most varied by sector and by type of employer, small, medium, large. But there were some general themes. There were a lot of employers that were using the funds to pay for new technologies. So, for high-tech that could mean keeping your workforce skills fresh like Cloud, migrating to Cloud technology, for example. But for even people like janitors that are entry level positions, a lot of those roles are starting to integrate technology in new ways and some basic digital literacy training was needed at those types of organizations.

And then a lot of people, with the baby boomers retiring, they're seeing a lot of need for applied managerial and supervisory skills throughout a lot of the companies that we interviewed. So, I think that's important to note and it kind of connects back to what can the community colleges do that an employer's need is supplied.

And then we heard differences in how the different sized companies talk about the type of help that's needed. So, what we found was that a lot of the small and mid-size employers because we are growing fast and they are trying to create these new learning systems for the first time, a lot of times they didn't know which training providers to reach out to. Who gives a good quality management training? What should be look at to evaluate the effectiveness of that training for our needs in this sector? And so those are the things that ETP could consider in the future in terms of, you know, what could they do that's a value add for those types of businesses?

So, now I'm going to pass it back. Hopefully, the presentation will stay. Dr. Marian to talk about the impact study.

MR. NEGOITA: Yes, so, we also conducted a quasi-experimental impact study based on propensity score matching. So, basically we just compared ETP funded companies with non-ETP funded companies that were very similar. I'm not going to go into technical details. We can maybe save that for Q&A, the Q&A piece of it.

But the big picture as you can see in the slide is positive. We found positive impacts on both employment and revenue or sales for ETP funded companies. It's all varied as you can see in the whiskers the accuracy of the estimate varied. Some were more precisely estimated and some less. But overall, I think all of these were statistically significant positive impacts. And they suggest that, you know, ETP funding might have contributed to increased labor productivity and increased competitiveness as a result, which both would be expected to increase size and revenue.

And then beyond that, we sort of looked into a couple of sort of types of companies to see where the impact is really coming from and we did multiple things. But for now, we can only concentrate on the company size. So, as you can see here, we basically found that small and medium companies basically between 19 and 100 employees, appear to benefit the most from this kind of funding. Larger companies, there's a small but insignificant impact on them. For very small companies, their appears to be a negative effect on employment that's significant. And we can talk about the implications of that a bit later on. But roughly these were the basic findings, which kind of suggests that small and medium companies tend to benefit the most. Annelies?

Yes, and briefly, policy implications, which I will share with Annelies. I will start by saying that the findings suggest pretty, you know, strongly that there's potential for an ETP kind of program in terms of stimulating economic development and entrepreneurship, you know, job creation and preservation. There's also this issue of staying on top of technology. And investing in training appears to be a promising way to deal with that and stay competitive.

We also are finding in the times of the pandemic, that, you know, once your small and medium companies disappear from your neighborhood, you kind of tend to notice and not in a good way. And so anything that makes, you know, for a more vibrant local economy seems to be like a really good thing to have. There's a bit more discussion that will need to happen into the needs of very small companies. You know, what's happening there? Are there particular ways that they can be served in a way that helps them? Because they appear to have very specific needs. You know, back to Annelies' point of, you know, thinking about user needs and so forth. But, yeah, overall these were like on sort of my side the big sort of takeaways and Annelies has a couple to share too.

MS. GOGER: Sure, so kind of backing out a little bit higher level here from the study, you know, a lot of us have been witnessing over the last two, three weeks after the killing of George Floyd a need to focus more on diversity inclusion in the workplace. In society as a whole, but also in the workplace. And so you have major companies coming out saying they're committed to anti-racism. I think employers can play a major role in creating internal learning structures for people to start in one position and move up to a higher level is part of that picture of how to build in more equity, including racial equity, into companies. And so I think that this should be thought through as a state strategy to incentivize more companies to engage in those building stronger internal learning infrastructure.

The second point kind of referring back to the previous panel, you know, we use Dunn & Bradstreet data, which was very expensive to come by, frankly. And, you know, you have to ask like why don't we have more complete accessible public data sources where we can actually analyze the effects of these investments on firms? Like firm level, site level data where we can see what's happening in terms of, you know, which companies are growing and may need more help with training. Which companies are at risk of layoff. Can we develop more like data intelligence using some newer data sources?

And then the final point is I think gets back to the question people raised in the last panel around partnership, right? So, a lot of the program as it's currently structured focuses a lot on compliance and, you know, making sure that the employer is reporting the hours every week in a hard copy form in a certain form, right? It's very compliance driven in its mindset. But what we're hearing from the, you know, there's this kind of priority of anti-fraud and making sure bad actors aren't getting money from the public. But we also have to think about the priority of making sure that we're, you know, the public money is being used in a way that's most helpful to the people that are trying to use it to encourage more employers to partner with community colleges, with workforce boards. You know, to what extent can we design these where you have balancing both priorities instead of just overemphasizing sort of the policing role that the state can play. So, I'll leave it at that and welcome some questions.

MR. CASEY: Okay, thanks. So, first before we get to the question and answer portion. I wanted to allow our panelists Melanie Zaber and Joel Branch to give their thoughts on, you know, various aspects of the public/private partnership piece that's being evaluated here. Thanks.

MS. ZABER: Thanks so much, Marcus. Annelies, Marian, I really enjoyed the paper. And I thought the mixed methods approach was a really useful one. With these kinds of public programs understanding that context is really important for thinking about the different impacts we see among different subgroups and understanding why that's going on. So, I think Annelies already reviewed this a little bit, but in particular the finding that paperwork burdens and that there's been a reduction in that more recently I found particularly interesting as context for your findings in this program.

Since I mostly work in the policy research space, I'm going to focus my comments in that vein and sort of how you could maximize the learning from this for policy. And I think one of the biggest components is thinking about the average benefit of the program versus the marginal. And so what you are able to identify with the data that you have right now is thinking about for the employers that did apply and were approved, what did they get out of it? That's a really helpful piece of information, but in thinking about expanding the program, we'd want to know more about that marginal applicant. And so, you know, trying to brainstorm a few ways that you might be able to think through that. It looks like funding is varied at a fair amount. Over the different years the program in particular with the recent pandemic, there's been an extra wave of funding for ETP.

I was also curious if there might be different geographic distributions in terms of employers having information networks that inform them about the existence of this program and assist with application. And so you might find regional concentrations of areas where employers are more likely to apply. So, those are potential avenues to exploit to maybe try and get at some of that richer marginal impact so we can think about, you know, should California be adding more funding? Or should this be taken to a larger scale?

I also really liked the motivation, the framing about how employers underinvest in training because of the poaching risk. And I was curious to see if you were able to do any sort of calculation as kind of a return on investment to think about is this something that makes sense for employers to be doing on their own? And if it does, then this is where the qualitative study can be really valuable. Okay, so why aren't they doing it?

There was a really interesting model that France used for years in the '90s where instead of subsidizing training, they actually taxed employers if they didn't spend a certain fraction of their payroll on training. And so they -- you were able to do a lot of interesting studies there to see the impacts of that employer provided training. And they actually found reductions in turnover. But that's with a more universal adoption of this training behavior.

So, thinking about that, that broader context setting and also how the return to employers factors in here. What barriers they're facing. I think are important pieces for pushing the policy a little bit further.

The last thing I wanted to touch on and I know, Annelies, you mentioned data issues and I agree completely that we definitely need better measures of employer outcomes. So, you found large sales impacts among retail, but smaller ones for construction and manufacturing. And I wonder to the extent how much is that really just an industry specific context, not so much a training specific factor. So, are those really the best productivity measures for construction and manufacturing? Is it possible that training in these industries actually makes workers more efficient? And so that's why you're seeing muted impacts on employment. So, seeing more about what kinds of other outcome measures are the right employer side measures to think about. Are we getting a good return on this training investment, I think can be really valuable.

And then from the qualitative side, do we have evidence that employers of different sizes are using this program differently in terms of how they target employees they're training, who they're choosing? Or is really just down to those internal structures that you mentioned that small firms are just too immature to have these well-developed employee training systems? So, further teasing that apart I think would be really helpful for thinking about the future of this program. Thanks.

MR. CASEY: Joel?

MR. BRANCH: Thank you. Thank you. I read the paper, couple of times actually. It's a great paper, great, great findings.

As Marcus said, my background is computer science, and most recently, artificial intelligence. I also have a research background so I looked at the paper a little bit from that perspective. And I've also been in various conversations regarding automation and AI and the future of work. So, those are some of the thoughts brewing in the back of my head.

The way I formed my response thoughts were kind of three-pronged to give some idea of what workplace technology trends are like moving forward and the ramification of some of those trends, i.e., the future of work. And what should be taken from that paper like what should some of these policies look like going forward especially as we are in a recession and dealing with other, you know, events of the current time.

Number one, I think it behooves me to say that all work companies are looking at how to infuse not just automation, but AI into their business functions, right? This is like from customer service to manufacturer defect detection and even reduction of manual analytics, data analytics wherever possible.

Another thing that I thought was important to point out what's the difference between automation and AI, right? Well, the main difference is that automation is something that is very, you know, robotic and akin to replacing rote type of actions and behaviors, right? So, you could think of, you know, a traditional manufacturing line. Whereas, AI's more dynamic. You know, the nature of AI is sussing out patterns. It's about computers more or less self, self-programming, you know, take that term with a grain of salt. But it's about dynamic intelligent decision logic and that AI part is what's really exploding right now, okay?

Where will it have most impact in the workplace? A Brookings Institution report pointed this out based off of a PhD thesis from, I want to say, Carnegie Mellon, but I don't recall the details right now. Is that a lot of disruption will come to actually white collar jobs, right? So, we've seen perhaps, you know, radiologists, you know, legal services, clerking, et cetera, et cetera to have the greatest disruption. There will continue to be disruption, you know, at, you know, that traditional blue collar, you know, job, right? If we think about what's happening with the pandemic and what's happening with even cleaning a hospital. You know, there are deployments of robots right now that they go up and down hallways using UV lamps and disinfectants to, you know, provide some level of safety.

So, taking all of that and trying to, you know, marry a little bit more with my response to the paper, what new skills will be needed? And one way I think about this is to think about AI in the workplace as entailing three major roles. And that is trainers, explainers, and maintainers, okay? I wish I could have coined that. It's not mine. I got it from somewhere recently. But, it's a very nice way of thinking about that.

You know, when we think about trainers, we think about data scientists and engineers. We think about AI experts, you know, practitioners. When we think about explainers, which is really something more nuanced, something more contemporary. These are people who can interpret AI decisions. These are AI risk analytics, analysts, rather. And even AI auditors, okay? I want to point that out because and it gets into what sort of training might be needed going forward.

And then there are AI maintainers, which are akin to maybe your traditional IT maintainers, IT application, you know, engineers. And those can actually largely be automated. When we think about -- well, I said that kind of as a matter of fact, but I think they can largely will be automated going forward. So, I kind of say that to say that training and explaining is really where a lot of new skills I think will be needed.

Those skills, of course, being data science machine learning. As we go forward though, I urge us not to think about just those hardcore technical skills. But there will be new skills and human computer interaction that are needed. You know, how do we coincide with AI in the workplace? That'll also include sociology, psychology, et cetera, et cetera.

So, what are the ramifications? Of course, there will be some categories that will be eliminated. You know, jobs specifically and some categories, right? And, of course, as we get into from a training point of view, the core jobs as someone pointed out either in this session or the previous one, unfortunately there will be immense, you know, high paid -- not unfortunately, high pay is good, right? I obviously would like to be highly compensated for my knowledge in AI, right?

However, that will require immense competition amongst companies for that talent, right? I don't have exact figures, but, you know, the big four or five tech giants actually account for I think over 80 percent of employment of data scientists and AI practitioners. Of course, that means a lot of people want to work at Google. But what does that mean for other companies that want to harness that talent and obviously need to train those workers would be that sort of thing, okay?

So, let me fast forward a little bit here. Another ramification though is bias, right? So, you know, when we think about, you know, what's happening with racial injustice now, et cetera, you know, bias algorithms are a next wave of how, you know, our economy, how our workforce and how consumers on the other side of that workforce or our government processes can be affected, right? So, that is another part of AI-related training that should not be overlooked, right?

Now, how we go forward with this, I'll kind of conclude my remarks for now. We are in the middle of a, you know, a pandemic, right? And we're in the middle of a recession. And, you know, the nature of AI does require some rigorous training to understand how to apply it safely. You know, how to engineer data. How to, you know, take bias out of the equation. However, what we're also looking at is on a global scale, other countries such as China, Russia, et cetera, have already started immense AI centric development and training on a national scale, right? And some may argue that the United States is actually already behind. I would personally argue that. It's just my personal opinion.

So, that just means that, you know, jumping off of, you know, a program like ETP we have to look at how we take or institute and execute AI training or support AI training more so at a federal government level. It's, I think at this rate, it would be shortsighted to think that localities or states alone, you know, just alone can properly help this country as a whole be competitive on a global scale going forward with AI.

The other thing that we've seen also is that we have only various hotspots in this country. We have Silicon Valley. I happen to live near another hotspot, New York. I think also Austin, Texas. I was listening to a podcast off Waterloo, Canada just because I was recently listening to friends in Canandia (phonetic) -- in Canada, rather. However, you know, we can't continue going forward with just relying on these hotpots to provide training for AI competency, right? It needs to be a more level playing field. So, that's another thing to think about.

The other thing I will say and then, you know, shut up here, is that when it comes to training regarding automation and AI, another thing we should think about isn't just training new workers and training companies on how to take advantage of that and I believe it should be with federal government assistance. But there will be people who are displaced and there will be people who would be displaced in their -- in late age, right? Let's just, the numbers, you know, let's say their late 40's and 50's. And retraining folks like that for AI will be a little, you know, a little more challenging. However, we have to even think about reskilling those people to do other things, right? So, and I think about this in a context of what we saw with this ETP program. It's not just workforce training we should be considering on just that technical skill, but what are the ramifications that a waterfall of training people who are displaced to do other things. And that should be part of our strategic strategy as well. Thank you.

MR. CASEY: Okay, thanks, Joel and Melanie. Unfortunately, we're running behind a little bit on time. So, I'm going to encourage any audience members to submit questions offline to our various either our panelists or our speakers Annelies and Marian. I want to thank them again, Marian and Annelies, for an interesting paper, and Joel and Melanie for interesting discussion of these issues.

And I want to move along to the next panel so we can be sure that we have the full discussion today. Okay, thank you.

And so for our next panel, unfortunately, it was originally going to be moderated by my colleague Richard Reeves. But he had a little bit of an emergency he needed to deal with so I'll be taking over his duties. And we have three distinguished panelists to join us here to talk about the affects of COVID in the context of this discussion.

We have David Deming who's a professor at Harvard University and -- excuse me. And an expert in this area of automation and reskilling. We have Stephanie Riegg Cellini who's a professor in town at George Washington, right? And she's also an expert in education. And we have our very own Bob Litan who is a nonresident fellow here at Brookings and also a scholar and a lawyer and an expert on automation and future of work issues. And we're going to have them actually discuss, you know, give some observations on what they think is going to emerge out of the COVID-19 issue.

And so before -- I'm going to shut up in a second. But I'm going pose two questions to them and I'm going to let each of them actually give their basic thoughts on that and then we'll follow-up and discuss some of the policy implications.

So, the first question I'll pose to them is thinking about your own research and your own observation of what's been going on in the context of COVID-19 and we're thinking about the recovery from this if we ever are able to get to that point, get past this first wave. After COVID-19, what are the challenges you see in terms of being able to match skills? Our discussion earlier was on sort of skills versus credentials.

And so when you're thinking about this, how do we -- what challenges do you think we'll face in terms of more efficiently matching skills to job needs in light of automation? Especially after COVID-19 which, you know, one would think would actually push many companies given that machines don't get sick and people do, towards automation. And on top of that how do you think COVID-19 has illuminated or altered the landscape in this space in ways that ought to change our policy approaches? I'll let Stephanie begin and then David and then Bob can finish up. And then we'll talk about policy implications. Thanks.

MS. REIGG CELLINI: Great, thanks so much for having me. So, I guess I'd address these two questions by thinking about retraining. And we kind of know this need for retraining is critically important in mitigating job losses from not only automation, but also this pandemic as we've seen. And I really come at the topic of retraining after having spent the last 15 years or so studying for-profit colleges and this kind of sub-baccalaureate education in the United States.

So, I will say that I think one of these kind of big challenges we're going to be needing to think about is that I think the for-profit colleges and especially large online for-profit colleges, are seeing this pandemic as an opportunity for growth. And I do worry, I think this brings up some concerns about kind of a growing enrollment in these for-profit colleges with little accountability attached to it.

So, we've already seen some news reports of kind of increased advertising by for-profits, some optimistic comments by CEOs talking about how students might like to go back to school online or they might like these kind of more established online institutions as they might think of themselves rather than traditional colleges that are newer at online instruction moving forward. And when they're thinking about that reskilling, those for-profit colleges want to jump in. And we've already seen a few enrollment numbers up for the first quarter of 2020 for some of these large online for-profits.

So, we also know that in the last recession, for-profits saw enormous growth, their steepest growth. Enrollment grew I think it was about 70 percent just between 2007 and 2010. Really hitting a peak there as there was disinvestment in community colleges in particular. And not very much regulation at that time either. So, of course, now we see that many students may be enrolling online. Pre-pandemic, about 55 percent of for-profit students were attending completely online, compared to just 6 percent of students in the public sector. So, you can see that if COVID is going to push students online, where do we think they might go?

So, this raises some really important concerns for students, taxpayers, policy makers. I'm particularly concerned that students at these for-profits who are disproportionately lower income students and students of color, they'll be left with very low earnings and potentially debt that they can't repay coming out of this. So, just from my own research and research by Dave and others in this field, you know, programs in for-profits are about five times more expensive than programs in community colleges for similar certificate type programs.

Students are more likely to take on debt, take on more debt, more likely to default on their loans in these for-profits. And we know that certificate programs in these applied or vocational programs whether they're online or not in these for-profits have earnings that are much lower than similar programs for similar students in community colleges. My own work suggests that, you know, we're talking about $2,000 less annually and that students in these for-profits even over a lifetime of earnings gains, may have trouble repaying their debt in the average certificate program.

So, we also know that online programs don't tend to perform as well as on campus instruction. We, in the research we see that it routinely online instruction, you know, routinely finds lower performance in grades, follow-on coursework, those kinds of student outcomes that people have looked at in the online sphere there as well. And that's particularly troubling for students with weaker academic backgrounds have more trouble with online learning. So, I think that's something we need to look at as we move forward.

On top of all this, I will add that it's very hard for students to judge the quality of education they'll get. I think that's a key thing we want to think about as students look to go back to school and reskill and find that training provider that's giving them the program they'd like to go into in the field they want to get into. We know that the research shows that information posted on a website like the College Scorecard, for example, may not be reaching students who don't have a tradition of college going already. It may not be reaching disadvantaged students.

So, I'd also mention that I recently did some research looking at advertising and we know that for-profits spend about $400 per student on advertising compared to just $14 by public institutions per student. So, there's a big gap there on what students are hearing about colleges, what their promises are, what promises they're making, especially in the for-profits college sector.

So, to just throw out there, you know, I think we need to think a lot about investing in community colleges. We need to think about having accountability metrics in place so that, you know, certain providers of low-quality education, those providers can't take advantage of students as we move forward. And I think I'll just leave it there for that. I think I got a lot of ideas out there and I'll let others chime in.

MR. CASEY: All right, Dave?

MR. DEMING: Great, yeah. So, thank you, Marcus, for having me. Thanks, Steph, for teeing me up. It's just great to be here with you guys today.

Given the topic, I thought I might just talk a little bit, I guess, about how we were all thinking about this a few months ago prior to the coronavirus pandemic and then how that changes it. So, from our perspective, I think we -- everybody -- this is an issue kind of thinking about reskilling the workplace for the 21st century or however you want to say it was an issue when we had 3 and 1/2 percent unemployment. And of course, it's a even bigger issue today.

And I think just for context, you know, the U.S. spends very little and invests very little relative to other countries in training. Meaning, you know, kind of that liminal space in between a formal education and actually like, you know, learning how to do things on the job. So, there's this kind of in between space where in other countries, they have these formal apprenticeship programs or, you know, we have a community college system, but it's quite underfunded. Everything is much more federalized in other countries and centrally controlled so you have workforce boards. They get together with industry training councils and figure out, you know, if you're going to be in some skilled trade, what does that entail? Who are you going to work for? What are the terms of the apprenticeship? What is the cost sharing arrangement?

And the U.S. is very decentralized and a very free market. Which I think has a lot of benefits in other contexts, but tends to harm us in this context. Because if you think about it as a student, what do you want to get out of an education? You only have a few years in which you're paying a very high opportunity cost in terms of forgone earnings to go to college. And so you want to make it count. And so you want to get an education that's going to last you for the rest of your working life, 40, 45 years. You need to learn some skills that are future proof, if you will.

And those, you know, ideally are quite transferrable and quite flexible, right? And they're not really that applied. Because you might learn the latest techniques in how to be a welder, or an electrician, or a computer programmer, or anything else, and then technology might change and, you know, given how hard it is and how weak of a safety net we have, how hard it is to go back and get retrained, you really want to learn all that stuff ideally right away so you don't have to go back to school so you don't have to leave a job and find another job, et cetera. Because our social safety net is so thin for workers who want to go back and get retooled.

On the other hand, if you're an employer, what do you want? You have a job, a very specific set of needs that you need to fill today and you want to pay as little as possible for that worker. You want to support them. It's not that, you know, it's just that you don't want to hire somebody and then spend a lot of money to train them in the type of skills and capacities that they can take anywhere else, right? So, you're going to pay for all their training to become a software engineer and then they're going to go leave for a competitor company, right?

And so companies want people to have specific skills they need. And workers want to have general skills they can take anywhere, right? And so, there's a real mismatch in what both sides of the market want and are looking for. And that's exactly where these institutions, this kind of connective tissue comes in in other countries where you sort of meet in the middle and you kind of bargain over this and you figure out, okay, we're going to give you some employment security, we're going to get you retrained if the technology changes. And then you're going to invest in some specific skills that are useful to groups of industries or other kind of groups of regional employers or whatever. And this is a kind of hammered out in a very centrally controlled way, frankly. It's not the magic of the market.

And that's the thing we're really missing here in the U.S. And that thing that we're missing has just become more and more urgent as kind of the technology of what you need to do to be a valuable employee continues. That the knowledge frontier continues to push outward and our educational institutions are kind of giving us sometimes in the best case scenario, a very baseline set of skills that are highly transferrable. Whatever, soft skills, critical thinking, problem solving, however you want to say it. But then the employer looks at that and says that's great, you know, you're this kind of ball of clay that I need to mold. But there's very little information about what people can actually do. And so employers end up making these somewhat costly risky investments in entry-level employees and during good times, they're happy to do that because some of them turn out to be real gems. And then the other ones you can sort of move on from eventually, but right now nobody wants to make that leap.

And so I think what we're going to see in the wake of coronavirus is young college graduates and young high school graduates and all in between are just going to get hammered because hiring a new employee is a luxury item. And right now, what firms are looking for is to fill the kind of bear minimum of what they need to get by. And so I think you saw that happen after the great recession. Lots of people were harmed by the employment impacts of the great recession, but young workers were harmed disproportionately the most. There's some recent research suggesting that they weren't just harmed in terms of earnings, but they were harmed in terms of early mortality and health outcomes as well.

And so I'm very worried that's going to happen again. And I think it's partially happening because we do not have this connective tissue that links the two sides of the market together. So, I don't know, I think there's lots of ways for that to happen. It's probably not a federal solution. It's probably a local solution. But the federal government can support it in a variety of ways. And, you know, maybe we can talk about it more in the Q&A. But that's what I see is the broad problem we face in the U.S. today in terms of workforce training.

MR. CASEY: Well, that sounds -- that's quite interesting and provocative. Bob, if you want to step in with your comments?

MR. LITAN: Okay, thank you. And I appreciate being able to follow such two distinguished presentations.

So, your question, Marcus, is, you know, how has the pandemic changed things? This is not my insight. It's Richard Haass and the Council of Foreign Relations just pointed out that basically the pandemic has accelerated just a ton of preexisting trends that were already underway but now are sort of going at warp speed. Example, telemedicine, telework, and of course, automation. As you mentioned, robots don't get sick, people do.

So, all these things are going to happen and they're going to happen at a very rapid pace. Who knows what's going to happen to big cities as more and more people work remotely and their firms don't want them at all. So, firms are now redesigning their spaces like crazy so that their 6 foot, you know, people 6 feet apart. The open floorplan where I used to work about 8 years ago. I used to work at Bloomberg and if you look at a trading desk in New York right now at that, you can forget that, all right? You've got all these firms and all over the country they're trying to reconfigure how they're going to put people in these buildings. And a lot of them are going to conclude that 50 to 60 percent of their workforces should never show up. They may show up one day a week, two day a week, but the rest of the time, they're at home.

So, what's that going to do? That's going to promote sprawl. You'll have a lot of, you know, satellite centers. Maybe outside of the downtown or people are working at home. And what's going to happen to all those restaurants that are downtown? And all of these other little stores that, you know, give New York and other big cities their life? I mean, you're talking about ramifications that could not be predicted before the pandemic. And, frankly, we can't predict them now. And to me that is the greatest challenge in trying to retrain people. And I think previous speakers have pointed out that what employers are looking for in this environment is very specific skills and how are you going basically transition a lot of people. And this was a big problem before the pandemic. But it's certainly an even greater problem now.

I have some thoughts very quickly about policy because I only have a very limited amount of time. I'll just throw out a couple ideas and, Marcus, maybe this is a good transition to a larger discussion.

So, I've spent decades writing about two ideas that I think the time is now for them, all right? One is something called wage insurance, which would have the federal government compensate you for some portion of your wage loss. That would be triggered when you get a new job. So, if you were making 50,000 before, you get a new job making 30, you lose 20,000 a year, the government would make up let's say half that, maybe $10,000 a year. And that, in effect, would compensate the firm for retraining you in a new job and at the same time, it cushions your downfall. We have nothing like this right now. It was endorsed by President Obama in his 2016 state of the union address in only one sentence. I would like to see it as national policy.

The second and much larger idea is I would like to see lifetime training accounts. I originally proposed these as loans that would be income contingent repayment loans of the kind that you see in colleges. But I got a back -- actually a lot of pushback from a lot of liberals saying, why shouldn't this be free, or at least substantially free? And I'm just going to throw this on the table. People change their jobs like eight or ten times a year, they may even do it more. Eight or ten times used to be in the course of their career. They may do more frequently now because of the pandemic. If we had a system, for example, each person had 100,000 bucks in their lifetime training account that they could use to get new certificates as they leave jobs and move them and they get them from community colleges, for-profit colleges, et cetera, this would essentially allow them to accumulate these badges and be able to go back to work.

I do think a substantial portion of this ought to be loans and not free because I think people ought to have skin in the game. If you're going to give people things free, I think people are not going to take them as seriously as if they had to pay for it themselves.

And the final point I will address is something that Stephanie talked about, which is accountability. If we're going to send people back to these schools, whether they're for-profit or non-profit, I think we ought to have federally mandated standards about placement success of these programs. So kids or adults ought to know that before they sign up for a program and take on an additional amount in loans and/or get some free money, they ought to know that this particular program has a 30 percent success rate in placing people with the badges in the particular field in which they're getting a retraining. Or they don't have success. And what kind of salaries that they're getting. And I think without this information then people are going to get defrauded and people are going to waste their time and their money. And so I desperately think we need this in addition to financing. And I'll quit there because we have limited time.

MR. CASEY: Thanks for your comments, Bob. So, lightening round given our relatively short time. Are there any particular policies, either Stephanie or David, would you like to see enacted to deal with these issues?

MS. RIEGG CELLINI: Well, I might hop on what Robert was just suggesting in thinking about accountability for these training programs or community college programs, you know, for-profit programs in particular, and I would make a case for an earnings metric of some type. Of the type that might be earnings to debt, something like that. Or, you know, a high school earnings metric, something like that. I think job placement can sometimes be gamed. You know, what does it mean to be placed in the field? But I think a simple to understand hard to game type of earnings metric or accountability metric in some way is needed before we're, you know, dumping a lot of money into these maybe even these shorter term programs.

I know there's been a lot of talk of short-term PELL as well, using PELL grants for shorter term kind of job training type programs, particularly in public and non-profit institutions. You know, that's a different approach there that I'll throw out as a potential policy option. But I think it would need strong accountability with it and maybe be limited to public and nonprofits.

And then I will also say I think kind of going along this same direction as some of Robert's policy options, I'd say we need to look at income based repayment of loans and simplify that and make sure that more students are using these kind of income driven repayment plans.

MR. CASEY: Thank you. David?

MR. DEMING: Yeah, so, I mean, I think accountability is a worthwhile thing to think about. Something we definitely take seriously in a variety of settings and higher education and training more broadly. But I think there's another thing that we, I guess, as economists or as policy long tend to neglect, which is actually just direct design. You know, accountability is about imposing incentives and counting on the market to get it right. And I just don't think this is the case where the market is working very well.

I think one of the reasons why these programs don't succeed is because they're just not designed to meet the needs of the labor force in real time. And I don't think accountability necessarily fixes that. It sanctions the program that have poor outcomes. But it's highly indirect relative to just getting employers to the table and colleges to the table and potential students to the table and figuring out like what is a set of things that's actually going to work to meet the needs of the regional economy in which we operate. To meet the needs of global economy if it's something broader. I think that's kind of like hard design work that we tend to be -- you can't make a rule from the federal government that says do that. But you can create the kind of fertile soil in which those types of things happen.

And if you look at other countries that do this more successfully. But I wouldn't want to take like the German or the Swiss model of apprenticeships and just say replace U.S. higher education with that because I think we have a lot of other advantages. When it comes to this area that a lot of people call middle skills or kind job training or more specific things, I think almost all the countries do it better than we do. Almost all the advanced economies. And so maybe we can learn from that. And if we did, like without getting into the details, we'd see that they are much more intentional about, you know, industry councils, sectoral bargaining, like working out the details. And the government's role is to a guarantor and to say like we're going to finance this. This is going to be around, get to the table, figure it out. We'll support it.

And I would just like to see more as an economist maybe I shouldn't say this, we sort of have this temperament that we want to like set the incentives right and let the market do its magic. But I just I don't think it's going to work here. It never has. I continue to have skepticism about it.

MR. CASEY: Well, thanks. Those are interesting ideas and something that we can explore more in future conversations with the Future Middle Class Initiative. I want to thank Stephanie, David, and Robert for participating in this panel. I want to thank all of our earlier panelists and presenters and all of the people who showed up to watch. I think this was a very interesting discussion and one that sort of will feed future events put on by the Future Middle Class Initiative in this space. Thank you again, and until the next time.

MR. DEMING: Thank you. Be well, everyone.

MS. RIEGG CELLINI: Thanks so much.

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