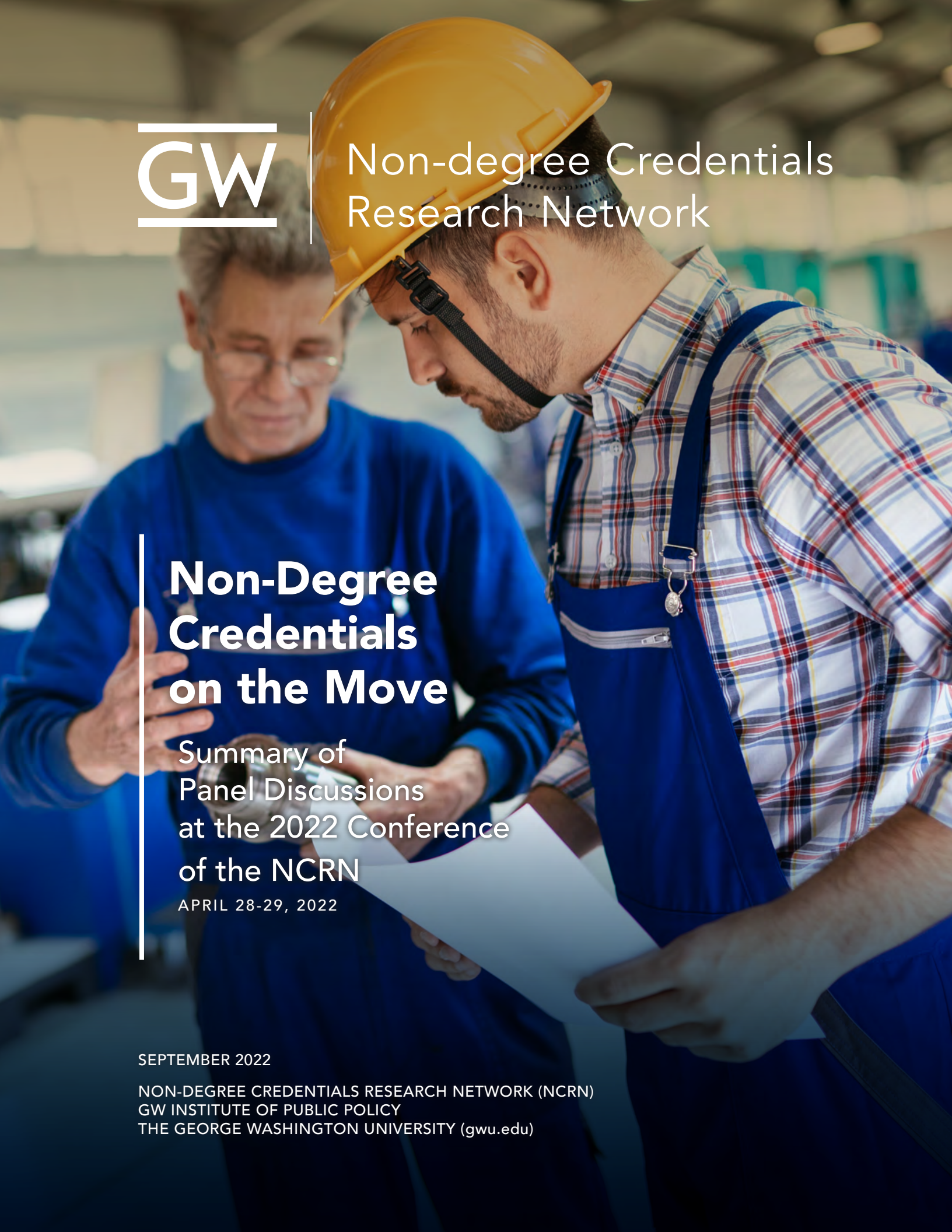

GW | Non-degree Credentials Research Network

Non-Degree Credentials on the Move

Summary of Panel Discussions at the 2022 Conference of the NCRN

APRIL 28-29, 2022

SEPTEMBER 2022

NON-DEGREE CREDENTIALS RESEARCH NETWORK (NCRN)
GW INSTITUTE OF PUBLIC POLICY
THE GEORGE WASHINGTON UNIVERSITY (gwu.edu)

In Memory of

Stephen Crawford, Ph.D.

1942 - 2022

Steve Crawford was an economic sociologist whose research focused on postsecondary education and training, non-degree credentials and credentialing, and labor-market functioning and fairness. He served as the co-director of GWIPP's Program on Skills, Credentials and Workforce Policy. In 2019-21, he was Principal Investigator for the Non-degree Credentials Research Network and co-director of the Better Employment and Training Strategies (BETS) taskforce. Earlier, he was co-PI for the Credential Transparency Initiative, which now is the independent non-profit, Credential Engine. In addition to projects on credentials, his work addressed student loan policy, employer investments in training, disruptive innovation in higher education, work-based learning and publicly-funded workforce development.

Before coming to George Washington University, Steve served as VP for Policy & Research at CFED and a Nonresident Senior Fellow at Brookings; Deputy Director of Brookings' Metropolitan Policy Program; Director of Social, Economic and Workforce Programs at the National Governors Association; and Executive Director of the Governor's Workforce Investment Board in Maryland. He also taught at Bates College and the University of Maryland, and was the executive director of research centers in Cambridge, MA and College Park, MD.

Steve spent three years in the U.S. Army as a training officer in the Airborne School and an infantry officer in Vietnam. More recently, he served on the Frederick County (MD) Board of Education and on the Obama-Biden transition team and the boards of ANSI (American National Standards Institute) and Workcred.

Dr. Crawford holds a BA from Cornell University, a Master's degree from the Wharton Business School and a Ph.D. from Columbia University. His publications include a book, Technical Workers in an Advanced Society (Cambridge University Press, 1989) and many articles, book chapters, white papers, policy briefs and reviews.

NON-DEGREE CREDENTIALS ON THE MOVE

APRIL 28-29, 2022

- International Developments in Microcredentialing
- Employers, Skills-based Hiring and Non-Degree Credentials
- Data Issues Impacting Researchers and Users of Research: Infrastructure and Public-Private Partnerships
- Labor-Market Outcomes of Non-Degree Credentials
- Public Policies Shaping the Non-degree Marketplace
- Credential As You Go: The Research Design
- Higher Education as a Provider of Non-Degree Credentials

The NCRN is a network of researchers and stakeholders in research studying all forms of non-degree credentialing – including licenses, certifications, apprenticeships, certificates, and badges – funded through a grant from Lumina Foundation. Views expressed by NCRN participants, including GW staff and affiliates, do not necessarily reflect those of Lumina Foundation and/or George Washington University

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PREFACE

The Non-degree Credentials Research Network (NCRN) held its fourth major conference in Washington DC, on April 28-29, 2022. Nearly 100 researchers and research stakeholders whose work creates or applies knowledge about non-degree credentials attended both remotely and on-site. Participants came from a wide range of organizations — corporations, membership organizations, government agencies, colleges and universities, and policy and research think tanks. Discussions spanned the range of non-degree credentials, including certificates, certifications, occupational licenses, apprenticeship programs, and badges.

This compendium presents summaries of the presentations from the seven main panels at the conference. The summaries are condensed, reader-friendly transcripts of each presentation and the question and the discussion sessions that followed them. Each summary contains a link to slides shown at the sessions.

This was the first NCRN event with in-person participation since the beginning of the COVID-19 pandemic, and the associated disruptions in the labor market and the higher education system were recurring topics of discussion. Conference participants focused on the many advances in data infrastructure and efforts to advance short-term credentialing and skills-based hiring since the NCRN's last in-person meeting. Recognizing that credentialing is a global issue — that many countries outside the United States face similar policy and research challenges — a panel focused on international developments in Australia, Canada, Denmark, Mexico, and the nations which are members of the Organization for Economic Cooperation and Development (OECD).

Several common themes emerged from the panel presentations which underscore important research questions for the field. These include:

THEME	RESEARCH QUESTION	ISSUE
Redesign of technology systems	How can technology improve data collection on non-degree credentials?	Many efforts to improve the learn-and-work ecosystem are finding that data systems on most college and university campuses are insufficient to capture detailed information on individual credit courses, non-credit credentials, and non-degree credentials nested within degree and certificate programs. The research community stands to benefit from helping campuses to collect higher quality data — and better technology can help campuses improve data collection practices at scale.
Changes in use of databases	What can we learn from new sources of "big data"?	Survey and, to a lesser extent, administrative datasets have been the bread and butter of non-degree credential data sources — yet we see signs of growing innovation in data collection. Examples include efforts to track post-completion outcomes using social media profiles.

THEME	RESEARCH QUESTION	ISSUE
State variation in using data and research	Why do states vary in the extent to which they are improving data and applying evidence?	Understanding why some states are falling behind in establishing partnerships to improve their data systems and not use research evidence (e.g., to reform their Eligible Training Provider Lists) is essential to advancing policy and practice reforms in credentialing and workforce development.
Greying lines between credit and non-credit instruction	What differentiates credit and non-credit instruction?	Non-credit instruction is often defined on the basis of how learning is recognized (e.g., through continuing education units), but it is often difficult to explain why a particular program is offered in a credit or non-credit format. There is clear interest in the NCRN community in understanding how non-credit courses and programs can be designed to fit into an incremental credentialing system that recognizes the transferability of non-credit learning to credit-based degrees.
Career and navigation challenges	How do we build a culture of using data to inform career and credential decision making?	There is growing need to know why some guidance counselors and individual learners are not using available data resources to inform their career choices and navigation plans. If data is underutilized due to barriers to access, the research community can play a role in designing better systems to disseminate labor market and credentialing pathway information.
Equity in job seeking/ hiring	Are individuals prepared to effectively navigate artificial intelligence (AI)- based technologies that are used to screen job applicants?	Understanding whether certain populations of job seekers are disadvantaged by the use of AI (among other emerging technologies) in the process of selecting job candidates can help ensure that the movement towards skills-based hiring does not exacerbate existing racial/ethnic and other demographic inequalities in the labor market.
Non-degree credentials and macroeconomic policy	How do non-degree credentials fit into U.S. industrial policy?	As global geopolitical shifts lead national policymakers to pay greater attention to the competitiveness of the U.S. workforce and industrial base, there is growing recognition of the role of credentials in upskilling and reskilling U.S. workers and expanding capacity in critical industries such as clean energy. This may lead policymakers to seek more evidence of the relationship between non-degree attainment, worker performance, and macroeconomic outcomes.

THEME	RESEARCH QUESTION	ISSUE
Expansion of work and learn programs like apprenticeships	What is the value of unregistered apprenticeships and apprenticeship-like work-based learning programs?	The failure to launch industry-recognized apprenticeship programs at scale highlight how little is known about work-based learning that falls outside the framework of registered apprenticeship. Understanding the characteristics of successful on-the-job training and/or informal apprenticeship programs could lead to the dissemination of best practices that expand opportunity for those whose needs are not well met by other types of credentials.
Variations by industry sectors	What is the value of non-degree credentials in competitive fields with weak labor market prospects?	Many NCRN members assume that non-degree credentials are most valuable in fields where labor market prospects are otherwise bright. But what if non-degree credentials could play a role in creating new opportunities and expanding markets in competitive fields such as the performing arts?
Variations of small and mid-sized companies compared to large	How much of what we know about the practices of large employers applies to the hiring and training practices of small and mild-sized firms?	Many of the studies of employer practices to promote credential attainment (e.g., tuition assistance programs) focus on national and/or service-sector employers such as IBM, Humana, Amazon, Starbucks, and Walmart. To replicate the successes of some of these firms more broadly, we need to know what small- and medium-sized firms are doing and what supports and policy changes would help them to better implement best practices in hiring and credentialing.
Global developments	What can we learn from the European approach to microcredentialing policy?	The European Union is systematically building a policy framework that situates certificates and other non-degree credentials (e.g., badges, microcredentials) in the larger higher education system. Could such efforts help U.S. institutions to launch and ensure the quality of microcredentials and other non-degree credentials?

These research questions are a sample of the areas of study NCRN members focus on in their work. The presentations and discussions described in this compendium contain many more important topics that need further study to inform efforts to realize an equitable learn-and-work ecosystem that contributes to growth and opportunity for all Americans. If you are involved in research addressing any of the topics described in this compendium or are able to apply this knowledge in your work, please visit the NCRN's website or contact us through the GW Program on Skills, Credentials & Workforce Policy (pscwp@gwu.edu) to learn more about opportunities to engage with us.

1 CREDENTIAL AS YOU GO: THE RESEARCH DESIGN

Three members of the Credential As You Go national team joined the 2022 Non-degree Credentials Research Network (NCRN) Conference, *Non-degree Credentials on the Move*, on April 28th to discuss "Credential As You Go: The Research Design:" Kirk Knestis, Principal of Evaluand LLC and Research Lead, Credential As You Go; Nan Travers, State University of New York, Empire State College and Principal Investigator and co-lead, Credential As You Go; and Holly Zanville, Research Professor, Program on Skills Credentials & Workforce Policy, George Washington University, and co-lead of Credential As You Go. The panel also shared a blog, Reflections on Conducting Research in a Changing Credentialing Ecosystem (April 2022) to kick off the discussion. **Session slides are available here.**

NAN TRAVERS: The 2021 U.S. Census Bureau data reinforces the fact that the US is focused on a four-tiered degree system, and our language around credentialing tends to speak to the current but increasingly dated degree-centric system. Even when you're talking about non-degree credentials, you're comparing credentials against a degree-centric system. When we talk about alternative credentials, again, we need to ask, alternative to what? We are still locked into the degree mindset.

This is an equity issue. There are a little more than half of adults, 25 and older in this country – 52 percent, without a degree. Of those adults, about one-third have some college and no degree, or about one out of every six adults in the US. This means that the postsecondary system has not done something well or fairly. It's not about the individual. It's really about a deficient system. And when you look at that 52 percent without a degree, that is a great deal of undocumented learning. People are not being seen for what they know and can do. Their knowledge and skills are being hidden. We must be thinking about what that means.

We've had two grants supporting Credential As You Go. Previously, Lumina Foundation supported Phase I through SUNY Empire State College to conduct a landscape analysis across 41 states looking at 87 projects. Out of that, we extracted what is going on around different kinds of credentialing and developed the Incremental Credentialing

Framework and prototyped the framework with three institutions. We received a lot of feedback from faculty in the pilot work and national leaders in this space. We then received a US Department of Education IES grant in Fall 2021, to support Phase II work. Using the Incremental Credential Framework, we are doing rapid prototyping of incremental credentials across three states – Colorado, North Carolina, and New York. This year, we're working with 21 institutions (equal mix of community colleges and four-year institutions) in Cohort 1, across those three states. Additional institutions will join this work during the three-year grant. The grant requires a minimum of 90 new incremental credentials be developed, although I think we'll be way over that number.

There is a key research component that Kirk will share next. We are looking at two research priorities. One is about the feasibility of using the Incremental Credentialing Framework to develop credentials. As part of that research priority, we are looking at what it really takes to change our credentialing system. The second research priority examines learner outcomes for those who engage in incremental credentials

The third main body of work in this grant is a focus on a national campaign. We are exploring the messages we must get out there to all the different stakeholders. How do we best help a nation shift to accepting incremental credentialing as a normal practice? It has been important that we build in messaging within this work, because if all of us are not on board, transformation of the US postsecondary system will not be possible.

We have designed an "umbrella graphic" to depict our key work. In addition to the first three bodies of work already mentioned, we're also looking at what it takes in terms of technical assistance and professional development. Also, how do we focus in on equity and inclusion? This is a such a critical piece of this work. What kinds of policies need to be in place and where does policy change happen? How do we build trust? We all talk about quality, but really when you boil down quality, it has to do with what is trustworthy. Then how do we interconnect all these different efforts? We're really thinking about is how all of this fit together and integrate, so that Credential As You Go is not just one more thing that gets added on, but is part of the credentialing fabric. Learners acquire knowledge and skills in increments and should be credentialed along the way so that they are formally recognized all along their learning journey.

This work is spanning from non-credit to credit, from undergraduate to graduate, from outside of the institution to inside of the institution. We want higher education to be permeable to prior learning and workforce credentials. How do we think about all this as various learning pathways and be purposeful about it?

Our Framework includes six approaches that interlace. Basically, we are talking about skilling, upskilling, and reskilling, and what goes into a stackable pathway? How is it transferable? What are the transition parts? What's that mobility that keeps coming up? How do we partner, how do we integrate this with workplace learning and higher education learning and bring those together -- and really think about a truly integrated system? How do we look at what people already know and can do, and recognize that as part as the validation and the credentialing piece?

KIRK KNESTIS: As Nan pointed out, the research component of Credential As You Go has a pretty broad agenda, but it's wrapped around the two priorities Nan mentioned. To their credit, IES recognized that our work is studying things that are getting developed. So, our research design is a "Design and Development Research study." It's not a true efficacy study.

The two phases again are to first, conduct a policy analysis of state system and institution-level implementation of the things that need to be present for incremental credentials to get developed and deployed. That research is a very high-level view of the feasibility of policy as it is framed by the components of the Incremental Credentialing Framework. Priority 1 is framed around the six components of the Framework. There is a theory of action or logic of this that says that state agencies must do certain things to empower the institutions; and the institutions then have to do certain things to empower the programs to create incremental credentials. We're looking at factors that influence the implementation of alternate credentialing approaches at all those levels. We are using that term factors to refer specifically to external components that may be bearing on the problem. We're looking at the influence of the community communication strategies that are baked into the national campaign that Nan referenced. We're looking at actions that must be implemented locally to make these things happen. For example, around advising: What do you have to do if you've got a new incremental credential? What needs to be done at the point at which that is introduced and communicated to students?

We're also looking at the internal conditions, what we're calling the readiness to effectively implement incremental credentials of various types. All of this is being driven by qualitative policy analysis. One of our efforts will be talking to state and institution level folks—we anticipate talking with a number approaching 180, maybe more informants, across the three states, five systems of higher education, and 21 institutions. There will be a series of interviews and focus groups to try to understand their perspective on all of that.

The second research priority is an outcome analysis that will be more familiar to folks who are used to thinking about research with a capital R. This research is a focus on outcomes, and I use the words, outcomes evaluation. This is not a true impact analysis in some important ways. We must be realistic about the numbers that are going to be involved. Issues of analytic power start to go out the door when you're talking about a unique credential that will be implemented at one site for a group of students that may be new to postsecondary education. We have broken the outcomes analysis into two sets of outcomes. One we're calling the core outcomes, and these are the ones that we've promised IES we will address with our comparative analysis on enrollment persistence (term to term) and completion. The thing we are calling progress is about whether folks are making substantive serious advancement toward whatever their learning outcomes goals are for their pursuit of education. All of this gets complicated fast.

We have other outcomes we're looking at, and these are going to be more what I think of as targets of opportunity, depending on what data are available—transfer education, continuation, and employment outcomes. We know the data vary a lot of state-to-state and system-to-system. So, we didn't want to get too far out ahead of our skis on making promises about finding anything out about them. This is going to be an analysis of extra system data that we'll be getting from the university's community colleges and state agencies. We're going to have learner-level record data, which is going to be crucial to this, but importantly, the analysis we're going to be using is a comparative interrupted time series analysis. So it gives us two opportunities for comparison—whether the introduction of a new credential bends the line in any way, in terms of outcomes, enrollment, and persistence, for example, at its introduction; and looking back in history at whatever was the precursor thing to the hot new incremental credential.

We're also going to try to find comparison credentials to examine what the differences and outcomes might look like between the new credential and something that I'll perhaps ill-advisedly say, is the "treatment credential." You've seen some examples

at the conference in the last two days about how these things vary. So that's a crucial piece of the puzzle, but ultimately, we're going to have, by the time we're done, at least 90 incremental credentials, and probably more comparisons of experimental credentials to education as it's typically been done.

And I have a quick update. We have our priority credentials that are surfacing as being the ones that we're going to be doing the analysis on first. I have been struck by the variability of the innovations that are going on here. As examples, we have a bachelor's degree in criminal justice developed with a large city police department. We've got a critical care skills microcredential for nurses. We've got a pet grooming, sitting, and training microcredential that is part of a veterinary tech program that captures people that might otherwise wander off to other job opportunities, but also meets a growing need for pet care post-COVID. We have a teaching assistant microcredential in high-needs areas developed with a commercial partner. We've got a couple of different para-educator certificates: One is a certification to capture incumbent workers, paraprofessionals, and others who might otherwise be pulled out of education to go work for the private sector. And the one that popped up today on my list of priorities, a couple of graduate-level certificates in online teaching excellence and teacher professional development. These span a full range of pre-college to graduate level and across all kinds of different spaces in the public and private sectors. So, it's going to be interesting to find comparisons for all of those new incremental credentials.

I'd like to share some of the key challenges in the research component of Credential As You Go:

- We have a complex theory of action here. We've got money getting spent at the policy level that's supposed to eventually impact learners. There's a lot of "if-then steps" between Point A and Point B and we've got to try and understand that whole set of causal linkages.
- There's some inherent tension to both designing and developing, and then studying, these things. We've got to have balanced feedback to inform the improvement of these credentials, even as we're being asked to test and see if they work, and for whom.
- If we do this right, the traditional outcomes are going to become meaningless, because we're trying to redesign the system. Because we're very fixated traditionally on looking at degree completion, what happens when it's no longer just degrees—when it's a lot of smaller pieces? How do we think about that, how do we talk about that, and how do we measure it?
- Data systems are very complex, and we've got some practical challenges of dealing with 21 institutions and five state systems of higher education. Anybody here that's ever negotiated a Data Sharing Agreement or Reliance Agreement with an IRB will understand what that means.

Let me close with what I've learned in the last day at the conference: the variability and cleverness of the innovation that is going on in this space means that we are studying something very dynamic, and that has its own challenges.

HOLLY ZANVILLE: I'm going to talk briefly about raising awareness through research in Credential As You Go's work. Nan already shared the umbrella graphic. There are two elements on the umbrella that are particularly related to raising awareness. First, there is a national campaign we're undertaking to build understanding and support for an incremental credentialing system. Second, we will need a strong research base to inform implementation, because the messaging we need to do is primarily to bring evidence to the many stakeholders – learners, employers, workforce boards, accreditation, the quality control and regulatory agencies, policymakers, and others. They all want evidence; they all want data. For example, will this approach work better than the 200-year-old degree-centric system we already have? We will need to present good evidence to build a stronger policy base to promulgate an incremental credential system.

We're trying to work with many partners to change the system in the US, partly with the help of a large National Advisory Board (to date, more than 125 members). We decided to go big because we want to work with an influential group of folks who have deep networks; can promulgate messages; can say we need better data on this, that or the other, because Credential As You Go is really a movement.

We are also going to be collecting data, of course, on incremental credential outcomes. And we're going to be putting several resources at our website. These will include an inventory of examples of incremental credentials being developed both at the undergraduate and graduate level, in a variety of disciplines; and an inventory of the policies that support incremental credentialing. Stakeholders are asking for examples of policy changes in the states especially, asking if Credential As You Go can share the language. This is part of scaling this work and raising awareness of the movement.

We're issuing an online newsletter every other month to update audiences. If you haven't subscribed, let us know. We'll be issuing briefing reports and blogs as well. Also, we're sponsoring webinars, conferences, and summits on many of the issues related to incremental credentialing. The website is **www.credentialasyougo.org**.

That gives you a sense of the type of work we're focused on under the umbrella – related especially to awareness-building and research. We're happy to take any questions and welcome your thoughts about the Credential As You Go movement.

1

CREDENTIAL AS YOU GO: THE RESEARCH DESIGN

NCRN MEMBER: There is the concern that steering learners into shorter-term credentials introduces a major equity issue because of increasing our potentially bifurcated system. How are you addressing this?

NAN: Yes, this is a very real concern and one of the critiques we got early on that we've been trying to be very conscious of—that we do not create another dead-end system. As we build these systems out, we need good data on what it takes for incremental credentials to be effective for all learners, including good advising/navigation services. We do have a lot of credentials out there already, some that are not clearly within designated pathways connected to education and work. As a result, we could have a whole lot out there that become worthless. We're trying to emphasize that there are incremental credential pathways that are "connective tissue." And we need to understand how everything fits together. When that becomes transparent for people and they understand that if they get this credential, it now gives them these multiple opportunities—and with a little bit more they can go further and further—that transparency and the information about the competencies and skills that are embedded in there is all transparent and will help learners make informed choices about what is possible. Then we will start to move the needle on this, so what we know we must do is to work with lots of other groups —a lot of you in this room and others—to ensure we are building a fair system.

In addition, if everyone automatically is awarded incremental credentials as they move through education and work, the incremental aspect should not carry stigma attached to it. Incremental credentials would be normal for everyone.

We are exploring how institutions can award credentials automatically and not require learners to jump through hoops and apply for recognition.

There is also a greater importance for Learning and Employment Records (LERs). Learners need to have their knowledge and skills captured from work and from learning and be able to share a comprehensive record to inform people about their capabilities. Employers and educators will need to understand how to use it. How information, such as what Credential Engine can feed into these records, becomes even more important. We will have to work together and build a system in a way that takes all these things into play.

NCRN MEMBER: The universities especially are going to continue to support degrees as the best approach for learners to find good jobs. Many are not fans of short-term credentials.

NAN: We are seeing more and more university programs seeing these developments as complementary, not positioning different types of credentials in contrast to the degree. These credentials are being embedded in higher education offerings. The degree is also a type of incremental credential. We are emphasizing that people learn in increments and there should be credentials that capture that learning all along the way—it is not an either/or but in addition and along the way from one degree to the next. These increments add up and give a profile of what somebody knows and can do instead of just credentialing large chunks of learning at only four levels – associate, bachelor, master, and doctorate.

NCRN MEMBER: What is the pathway you're thinking incremental credentials fit into? Some will not be in the data system at an institution and the data won't be able to be pulled down.

KIRK: We must start rethinking the kinds of data we're collecting, how it's been collected, and how the systems are designed to collect it. Changing the credentialing system means we've got to change the data structures and we've got to change the technology behind them. There's just a lot of pieces here that we need policy around, but we also need some of these other structural pieces.

NCRN MEMBER: Are the institutions coding for microcredentials in their student information system in the states you're working in?

KIRK: Some of them are just starting to think about it, some of them were started already. This depends on how they're organized, i.e., if they've got their non-credit linked well to their credited learning that makes it easier, but it's still very preliminary.

HOLLY: We are talking more and more about the technology side of the shop in Credential As You Go's work. I don't know that that body of work—the technology work—comes out on the umbrella graphic we shared, but my belief is that the technology challenges around data—having good data systems—are an area we need to represent more in our work.

NCRN MEMBER: There are many industry certifications where you only need experience to get into a job, and sometimes this is three years of experience in an associate degree plus a year of work experience, not a bachelor's degree. I'm wondering about looking at industry certifications that allow a person to get into a credential with only experience, and then see what happened to them as they do, because one of the things we're thinking about is the chicken and the egg, so to speak. Does getting this industry certification promote them and/or leave them wanting some higher education—like a certificate? Or does higher education and taking a course make them think they could do a certification? What's the relationship and the pathway? I'm thinking about a supply chain manager, which is one of the hottest certifications going. Another is experienced behavioral analysts in the mental health arena.

KIRK: We are going to need better data around these types of issues. When I received the initial list of new incremental credentials from our state coordinators, at one of our universities it was interesting to see an example of a bachelor's degree that is structured in a very different way. It picks up attributes of shorter-term credentials—and the Incremental Credentialing Framework—in terms of being developed in partnership with a specific need for a particular group of people, as opposed to being something that's driven by the institution. I think we will see a whole suite of possible credentials in bachelor's degrees, associate degrees, master's degrees, and doctorates and professional degrees. They're all fair game if we're thinking of them as just a subset of the bigger set of credentials broadly.

NAN: We are also seeing some institutions designing industry credentials into their program, whereby the credential incorporates gaining the professional recognition as part of the process, so learners leave the program with the industry credentials. This is also one of the approaches in the Incremental Credentialing Framework. We want to see that all learners are formally recognized for what they know and can do regardless of if a degree is part of the process.

2 DATA ISSUES IMPACTING RESEARCHERS AND USERS OF RESEARCH: INFRASTRUCTURE AND PUBLIC-PRIVATE PARTNERSHIPS

Five expert researchers joined the 2022 Non-degree Credentials Research Network (NCRN) Conference, *Non-degree Credentials on the Move*, on April 28th to discuss Data Issues Impacting Researchers and Users of Research: Infrastructure and Public-Private Partnerships. Moderated by Chris Mullin (Lumina Foundation), the panel included Kyle Albert, Director of NCRN and Assistant Research Professor at George Washington University; Mark D'Amico, Professor of Higher Education at University of North Carolina – Charlotte; Heather McKay, Executive Director of the Virginia Office of Education Economics; Felicia Perez, Managing Director of the Information as a Product Program at the National Student Clearinghouse; and Andrew Reamer, Research Professor at George Washington University.
Session slides are available here.

GW-CENTER FOR REGIONAL ECONOMIC COMPETITIVENESS NON-DEGREE CREDENTIALS ADMINISTRATIVE DATA REPOSITORY

KYLE ALBERT: As many of you know, the GW Institute of Public Policy, in collaboration with the Center for Regional Economic Competitiveness (CREC), received a grant to create and analyze a repository of administrative data. We're working with a talented GW graduate student and will have a postdoc joining us in the fall.

The project includes four parts: (1) locating and compiling metadata from administrative data sources; (2) evaluating the quality of those data sources; (3) conducting research using that administrative data (i.e., anything we can say about the labor market value of non-degree credentials and how that labor market value might differ across demographic

subpopulations); and (4) constructing a repository of metadata. We're hoping the repository will be a permanent resource for the research community, which includes but is not limited to the NCRN. The repository will help people answer the question "if I'm interested in a particular topic, where do I find the data that will address this topic?"

I want to say a few words about what administrative data is and how it differs from the survey-based research that a lot of researchers in the NCRN have traditionally used. First, it's not necessarily the same as big data. Administrative data is usually generated in the process of performing some sort of government function, or the function of some business. For example, we might have an administrative dataset from a motor vehicle licensing agency on the characteristics of cars that people have registered, such as the value of those cars so that vehicle taxes can be calculated. In the context of credentialing, we could be looking at transcripts from educational institutions, tax records, or other types of financial records that would allow us to link credential attainment to earnings without asking people what credentials they hold and how much they earn.

This contrasts with big data, a term we usually associate with data generated by electronic apps and software where you have a huge amount of data on who clicks on what, at what time, and from what location. Administrative data sets are larger than surveys because they encompass the entire population; there's no minimum size – not necessarily always millions of records but in some cases in the hundreds of thousands – especially if the individual, rather than the credential, is the unit of analysis.

We see potential synergy between administrative and survey data. I want to make a note of the National Training, Education and Workforce Survey (NTEWS) in the field being collected right now. That will be an amazing source of data that will follow in the footsteps of the GEMEnA surveys. GEMEnA was the Interagency Working Group on Expanded Measures of Enrollment and Attainment. That working group was active for nearly a decade, culminating in 2017 with the Adult Training and Education Survey issued by the National Center for Education Statistics (NCES). Those surveys led to significant improvement in our understanding of non-degree credentials. The NSF is interested in administrative data, looking for what's next and how to advance the field with richer data. This is especially important as survey response rates are falling over time; many people are not responding to telephone surveys and it's getting harder to get a representative sample in some of these survey datasets. An administrative dataset will cover just about everyone in a population of interest. But we recognize the need to mix and match methods and combine survey and administrative datasets to answer questions of interest.

Some administrative data sources are going to be strong for credentials. For example, the Registered Apprenticeship Partners Information Database System (RAPIDS) dataset is very strong for one type of non-degree credential, apprenticeship. Others will cover many different types of non-degree credentials but focus on one population of interest, like the PIRL, Participant Individual Record Layout, developed by the Department of Labor – ETA. These are a couple of the datasets we'll be looking at in this project as we're moving into an evaluation of the quality of data.

We're also looking at the Post-Secondary Employment Outcomes (PSEO), a subset of the Longitudinal Employer-Household Dynamics (LEHD) program that is part of the Center for Economic Studies at the U.S. Census Bureau. There is also the National Labor Exchange (NLx) Research Hub, a unique data source containing bulk job postings data published by the National Association of State Workforce Agencies. We are looking too at COOL, the military's Credentialing Opportunities Online, and the DOL's Certification Finder and License Finder. We're looking into getting direct data

from certification and licensure agencies wherever possible, and the National Student Clearinghouse and Emsi Burning Glass are among other examples of privately held administrative data that we'd like to review for our project.

We have a set of criteria by which we're evaluating each dataset. The goal is to help researchers identify which datasets are of the highest quality for the questions they might individually want to ask. We're looking at use cases, which include measuring the prevalence of non-degree credentials and their labor market value.

For next steps in the project, we'll continue to incorporate NCRN and non-member feedback in the future. We want to know how we can do this quality assessment and build the repository in ways that will be useful for this research community. Over the next year, we'll be doing analysis projects focusing on the use of administrative data to estimate the prevalence and labor market value of credentials; building a repository which will mainly focus on metadata; and work towards identifying what sort of interface would allow researchers to search for and use data effectively.

COMMUNITY COLLEGE NON-CREDIT DATA INFRASTRUCTURE

MARK D'AMICO: Community colleges and four-year colleges award both certificates and micro-credentials, as well as related instruction. Despite the important role that community colleges play in the non-degree credential universe, non-credit education at community colleges is often referred to as the "hidden college" because when compared with the credit side of the house, it doesn't get nearly the same attention. One of the reasons is probably because the data aren't nearly as robust or consistent. So, why collect community college non-credit data? Just thinking about the prevalence, around four million community college students are enrolled in non-credit courses. That's about 40 percent of the community college headcount nationally. Non-credit is clearly an important part of their overall mission. Yet, multiple analyses have shown that only about three-quarters of states are capturing robust non-credit data at the state level.

At present, there's a clear lack of consistency and definitions in terms of data or even what non-credit is. Several years ago, I reviewed the literature on non-credit community college education and found a wide variety of labels, names, and terms about what non-credit is. Building on this, we've built a typology of non-credit: occupational training – that's what individuals typically enroll in; sponsored occupational training aka contract training; personal interest courses; and pre-college courses – things like GED prep, ESL, developmental education. I and others have used this typology in our work and it's worthy of additional refinements. These types are just the tip of the iceberg when it comes to non-credit data, i.e., in terms of the data elements that need to be better understood and collected more consistently.

There are other data quality issues. I worked on data quality with a colleague in New York, Dick Romano. We explored a problem with not collecting non-credit data at the national level. For instance, when using IPEDS data to calculate per FTE spending in higher education, the expenditures used in the numerator of the formula didn't tell the whole picture when the denominator only included credit enrollments. You have expenditures from the whole enterprise of higher education, but most calculations only include the credit portion because that is what's in IPEDS.

For the community college system in my state of North Carolina, if you include non-credit enrollments converted to FTEs, it reduces the per student FTE expenditures by about 25 percent. That might not

speak to the non-degree credentials per se but does speak to the overall issue of why non-credit data collection is important.

Then there are potential opportunities that are under-explored. Since we lack data, I wonder if keeping better verifiable data on non-credit could potentially ease non-credit-to-credit transitions if students could be tracked over time in databases that included both non-credit and credit enrollment? That's something for us to consider.

So, for these reasons and more, Michelle Van Noy and the Rutgers Education and Employment Research Center sought an opportunity to explore the non-credit data infrastructure in greater detail. To borrow a term from your provost [GW Provost Alan Bracey] who just spoke, we're essentially doing "non-credit discovery."

With support from NCSES, Rutgers and our team, which also includes many other colleagues, we're working on a multi-phased project exploring available non-credit data elements at the state level and developing operational definitions for those elements. The states are currently producing a dataset of their non-credit courses and programs, a list of all their programs, and the available data about each of those programs. We have been able to capture this in our inventory and are receiving the data now.

We will be working on state reports, followed by a cross-state report that will include a taxonomy for non-credit data collection at the state level. Ultimately, our intent is to work with additional states in a learning community as they work to build out their own non-credit data infrastructure. Along the way, we intend to learn more about the policy contexts that drives the data collection.

Our goals in this project are to (1) learn more about what data elements are captured at the state level, and (2) capture the details about the specific non-credit courses and programs. We will be looking at what courses and programs are offered, and detailed data of CIP codes. We'll ask, what are some of the outcomes and what are types of non-credit instructional characteristics? How long are these courses? How many contact hours? How are they delivered? Who teaches them? Is it someone in industry teaching them versus a full-time instructor? How is each funded? What data elements are they capturing on enrollment demographics, and can those be desegregated? Whether student services are provided or not? We also do not have good, clear, and verifiable identifiers needed to track students longitudinally. Those are important as well.

There are a couple of lessons learned so far. Without common definitions and terminology, even simple things like what is a non-credit course versus what is a non-credit program requires a lot of dialogue to understand. Also, understanding the commonalities and differences across states is something that's been fascinating when we bring together folks from the different states. And we're just beginning to learn about some of the policy drivers for data. States use data to satisfy mandated reporting, particularly on their funded programs and courses, but they are also used to make the case for additional non-credit offerings. Finally, the data infrastructure is not built overnight. That's an important message: it's an ongoing process that requires developing definitions, protocols, and expansion along the way.

IPEDS, in the institutional characteristics' header, is proposing to ask colleges and universities to report if they deliver non-credit education by different types. In the 12-month enrollment survey for colleges and universities, there has also been a proposal to report total non-credit headcounts. There's also a proposed a question about the possibility of future desegregation by race and sex. Another important proposed question that may seem a little buried is whether states capture non-credit clock hours, which is important ultimately if we want to convert non-credit enrollments to FTEs, and as a measure of program intensity.

One non-credit type in the proposed IPEDS categories may ultimately need a little bit of refinement, Continuing and Professional Education. Continuing education language could be confusing since some community colleges use that common terminology for all their non-credit offerings.

So, to go over a couple of final implications, it would be interesting to see if contact hours are available, perhaps even more available than headcount. I consider the IPEDS proposal to be a good foundation on which to build in hopes that future IPEDS data includes non-credit enrollments desegregated by non-credit type, student demographics, and outcomes. We hope that our efforts on the NCSES project may help inform the future work of states, as well as contribute to improving IPEDS.

VIRGINIA OFFICE OF EDUCATION ECONOMICS

HEATHER MCKAY: Our new office was created by legislation last year. The goal in Virginia is to really think about the connections between education and work, how those connections can influence policy and practice, and to use research and data to help make those decisions.

The core of our work is being led by Todd Oldham who was from Monroe Community College. He joined us as the research director at VOEE. Todd is developing a statewide supply/demand model for us. That model is going to change over time, and we will continue to build on it. We are building a website with supply and demand information for the state and the other thing that it will be is a data set. We're talking about a unique Virginia data set that we will compile that will include things like non degree credentials. We have high aspirations for what this is going to look like over time, but we're building as we go and we're adding things as we can, as we gather data.

We're making new data sets and trying to get a better look at how things like non-degree credentials matter in terms of supply and demand. We're thinking about non-credit degree credentials from K-12 all the way through workforce, including credentials awarded by institutions of education and by businesses throughout our labor market. On the demand side, we're thinking about non-degree credentials and what employers need, what are they looking for. How can we begin to gather data so we're using traditional government data sources but also things like job postings to begin to put this picture together? In addition, we have decided there are some holes we need to fill ourselves. That data doesn't exist so we're working to look at what exists in terms of potential non-degree data sources in the state. So much of what we know about non-degree credentials at the state level institutions is on programs funded with public support. If there are state dollars or federal dollars put towards those programs, we have some information but if there aren't funded efforts, it's hard to get information on those programs and credentials.

We're thinking about what that means, how accessible are the credentials across the state, what might be missing? To do that analysis, we're looking at what institutions have versus what we have at the state and beginning to do some comparisons to get the lay of the land and see what could be missing. We're also looking at funding streams, paying attention to the variety of funding streams for workforce and education in the state, both at the state and federal level. We're doing simple things like making SOC crosswalks to look at what's there, what are the kinds of things that they're funding and what related credentials are associated with these programs and funding streams. Finally, there are lots of bills covering non-degree credentials.

There is a lot of thinking about the idea of credentials, about adding more credentials to the Virginia economy, about thinking in terms of credentials to supply the labor market. We're using those bills to do more research to learn more and trying to use the research you all do to make those policies as good as possible -- and make sure that they help workers and learners in the best ways.

Another effort is the Virginia Skills Initiative. We received funding for this a couple of weeks ago. We're going to create two new data sets to help us learn more about Virginia, help supplement your work, and help us in policy and practice as we move forward. A first effort is an alumnus tracking project where we're going to take graduates from Virginia for at least five years and look at what they're posting about themselves on social media. We do not expect to get a return on everyone but we're hopeful for a return on about 30 percent of alumni across the State of Virginia. One thing we will be looking for are what are the other credentials they've gathered since they graduated from an institution in Virginia, what are the other things they've acquired on their path such as certificates we might not see in typical National Student Clearinghouse data, or other data from the State?

So, we're excited about that project; it's a little bit of a band-aid project right, we know that there's better data coming from the National Student Clearinghouse, there's better data emerging as IPEDS begins collection of non-credit data, but for right now we're trying to gather as much information as we can, and this is one way that we're going to try to do that. And the other data set we're gathering is a skills data set to look at educational programming across the state as much as we possibly can afford and figure out what the scope and scale of that looks like now. We're going to be scanning program data to collect the data set on skills and on credentials. We hope to make this a statewide data set at some point in time over the next two years.

Non-degree credential legislation has been all over the place in Virginia and probably many other states, but there are a couple of bills that emerged recently. One is SB 1275. Though it did not pass, we were following it closely and working with the legislators as they moved forward on this. It was supposed to create a credential registry in the state. Though it didn't pass this year, it will come back – we're sure of that. The Skills Initiative collecting that credential information is one way for us to begin to tackle this before it returns. The other bill, 565, did pass. Virginia doesn't have a budget yet but will by the end of the fiscal year (June 30). This is a bill to get 25,000 manufacturing credentials into the state. My office has a role to think about what those credentials should be. We also must think about how we are going to track those credentials, what are we going to do to make sure we understand that these credentials have been awarded after this has been legislated, that they have value, that they are of quality. Certainly, legislation is driving some of our interest in Virginia in terms of thinking about data and how we how we understand entrepreneur credentials.

We will be thinking about other policy tools and levers we can use to move forward. We're participating in NGA's work on institutional learner records and thinking about how our skills database can supplement that. We're going to put it into our own supply-demand metrics. And we'll also be thinking about how we input this into these reskilling, upscaling opportunities so as we learn more about what credentials are valuable, what credentials students are seeking, and what credentials exist, we will be able to help make better policy and practice choices. We're working at all levels with the administration and with institutions to think about how we can move this forward.

THE NATIONAL STUDENT CLEARINGHOUSE AS A RESOURCE FOR THE NON-DEGREE RESEARCH COMMUNITY

FELICIA PEREZ: The National Student Clearinghouse has been around as an organization for nearly 30 years and has a well-established process to collect enrollment and degree data. Our relationship with course data began a little over five years ago. We also see where the education industry is headed and have expanded our abilities to collect course non-credit, as well as industry credential data from organizations, other than high schools, colleges, and universities. We have also created data infrastructure to support collecting certification holders' data from certification bodies, as well as non-credit course information from colleges and universities, since there is such a strong correlation we're seeing between certificates, certifications, and this non-credit course data work. As we expand the NSC data set and extend the data insights and value we bring to other stakeholders within the education workforce communities, we began to develop relationships with industry credential certification bodies such as the National Association of Manufacturers (NAM) and others. I'm talking about industry credentials that are certifications awarded for third-party independent competency assessments; these are credentials that indicate a skill mastery and typically need to be recertified over time. Some examples of these certifying bodies include CompTIA that issues IT and cybersecurity certifications, Pharmacy Technician Certification Board, Board of Certified Safety Professionals, and others.

According to **Credential Engine's 2021 report**, there are more than 960,000 non-degree credential programs, more than 8000 of which are certifications. The quality of these programs, as determined by third party data, is largely unknown. The industry credentials project is put in place to address some of this. The problem is that there is no centralized data source on the outcomes or impact of certifications. There have been isolated efforts to collect this data by states, as well as self-reported data from certification bodies. But outcomes data are fragmented and, for the most part, incomplete.

How is the NSC helping to solve this problem? We launched an initiative that creates aggregate labor market outcomes for certifications so that educators, employers, learners, and parents can better understand the return on investment in the labor market. Our goal is to understand successful student pathways between education and the workforce, by integrating certification attainment with educational data and aggregate labor market outcomes.

As we first embarked on this project a few years ago, Lumina Foundation funded the pilot in the manufacturing space, partnering with NAM's Manufacturing Institute, the US Census Bureau, as well as working with the certification bodies of the American Welding Society and Manufacturing Skills Standards Council. We also developed a strategic partnership with Workcred, an affiliate of American National Standards Institute, to drive adoption of clearinghouse services with credentialing organizations. The Industry Certification Education and Performance Data System Initiative studied how industry credential attainment could be matched with and incorporated into the enrollment and degree information that the NSC collects and then matches against Census Bureau data to produce preliminary aggregate labor market outcomes. The data shows that most of the people who earn a manufacturing credential from the National Institute for Metalworking Skills (NIMS) or the Manufacturing Skills Standards Council are earning those credentials in the non-credit environment, rather than in high school or even on the manufacturing floor. Using the preliminary data, the NSC and its

partners were able to gain visibility into employment and earnings outcomes when the individual earned the credential. The data showed an immediate increase in wages, and the year over year increase in wages after the attainment of the last credential. The collection of industry-based credential data is done in such a way that we, while respecting the privacy requirements of all parties, provide student-level education data related to enrollment and degree, and aggregate reports that provide details related to education attainment, the programs of study, and demographic information. This data system enables collaboration between credential providers and postsecondary institutions; helps students, credential providers, and institutions understand the educational pathways that lead to success, and whether they lead to completing a college degree.

The data system recognizes industry credentials as a unique and valuable pathway into the labor market. It validates and verifies industry credentials as a key point along the student's educational life cycle and is a response to the nation's call for evidence of education competency and new skills.

Today, the NSC partnership with the US Census Bureau is working to provide aggregate wage data outcomes to the certification bodies only. We hope in the future to provide aggregate wage data outcomes to institutions as well. If your institution currently partners with any certification bodies, for example, and helps prepare students to sit for their exam or embeds credentials within a degree program, that is a great opportunity to talk with them about the benefits of participating with the NSC and providing that data to us. As we look into the future, we are pursuing conversations with institutions and associations that have stackable industry credential programs. Our goal is to increase the number of data-submitting organizations so we can improve access to all learners' credentials and continue to offer research insights on non-credit course credential data and the marketplace. If your institution or organization has, or is thinking about, offering programs that embed industry credentials into your degree programs or offer standalone industry credentials, please think about the NSC as a partner with you and let's share that data!

FEDERAL INITIATIVES ON NON-DEGREE DATA COLLECTION AND POLICYMAKING

ANDREW REAMER: I'm going to talk about emerging opportunities for research that you all can engage with. First, the federal government, because of both legislations passed a few years ago called the Foundations of Evidence-Based Policymaking Act of 2018, and some initiatives of the Biden administration creating a more institutionalized approach to evidence building and data collection that will have a positive impact on non-degree credential research. I will also talk about the National Labor Exchange Research Hub.

What I'm going to tell you comes out of my work with Kyle and Allison funded by the National Science Foundation, which we're now calling the metadata repository for non-degree credentials. So, as for administrative records, Kyle mentioned PIRL. However, there are a lot of federal programs that fund workforce development, and they all collect data. And, so, Kyle's handling quality assessment, Allison's handling the meditative development, and I'm like the outside guy and, so I started tracking down federal skilled technical workforce development programs. Skilled technical workforce is a term of the NSF, referring to workers with technical skills and a credential above beyond high school, but not as a bachelor's degree.

I've compiled a handout with a three-page list of close to 80 initiatives the government is running. The programs are largely outside of the Departments of Labor and Education. Congress has gotten the religion around workforce, training, and development in the realm of non-degree credentials. This is live on the **NCRN website**. There are several interesting things. One is that this information has not been collected before - no one in the federal government has overseen creating this list. So, I did that through this project and, at the same time in the fiscal year 2022 appropriations bill that just got passed, Congress directs the White House Office of Science and Technology Policy (see third page) that they are charged with coordinating with departments and agencies to create a national CTE and STEM education and workforce pipeline strategy. I'll be in touch with the person in charge of this and hand them this list so they can connect these dots. And that should have implications for research. As you can see, there are over 70 funded programs and working groups and reports due in the realm of skilled technical workforce based on legislation that's been passed.

There is the list of legislation that's been passed and signed. Also, before Congress right now there are innovation bills and they're going to conference committee- these things when you take a house bill and the Senate bill, you add them together and you get 1,000 pages or so. The nickname is the "Compete with China Bill" and, of course, workforce is critical to the nation's ability to compete. For the first time in really a century, the Federal Government is thinking about how to systematically assess the ability of the American economy to compete in global markets. It was not an issue after the Second World War, we had no competition. Things are different now. There is a focus on individual industries and embedded in these bills, there are initiatives around CTE and around non-degree credentials. When the Biden administration came into office, the National Economic Council issued a presentation and executive order telling federal agencies to assess the resilience of supply chains in six areas. This is industrial policy, making sure the appropriate agency was assigned products in each realm. Advanced batteries were Department of Energy. So, they did for product lines last June, and a couple months ago they came out with six industrial base assessments. Workforce is critical to supply chain resilience. Supply chain is a term that

none of us talked about two years ago, and now it's part of regular conversation. So, here's just a couple examples I pulled out from the energy and the transportation supply chain assessment. A goal is right at the beginning - there's five priority goals – here's one: attract and support a skilled workforce for clean energy transition. What I'm suggesting is there's an opportunity here for academic researchers interested in the right credentials to think about how to link up with these departments, who may pay for work to achieve these aims. You'll see the use of the term skills; you'll see workforce development. There is not a big focus on degrees.

Manufacturing USA is a program of the Federal Government to support emerging technologies and they are adding industry credentials to their mission. Now, the NSF has a skilled technical workforce initiative; up until five years ago, the only workforce they focused on was bachelor's and higher. In 2015, it changed to thinking about what's going on in the contemporary labor market, like middle skills, middle skilled workers, and now it's skilled technical workforce. The National Science Board is regularly issuing reports that look at the skilled technical workforce in America as part of the broader STEM workforce. Of course, we have the data repository project we presented on previously, and then there's the NTEWS which is in the field. It will be done every two years; it'll switch places every year with the National Survey of College Graduates.

There is also the Evidence-based Policy Making Act that called for the exploration of the development of a **National Secure Data Service** (NSDS). The idea is to allow researchers to get hands on confidential micro data and link it.

For whatever reason, the Department of Education did not post its five-year plan, but has a one-year evaluation plan, and focuses on research projects on the pathway to careers to career college. The Commerce Department is focused on its clientele—basically businesses but businesses need workers—so this is a strategic objective of the learning agenda of the Commerce Department: to build sustainable employer-driven career pathways and better help underserved communities. So those are key updates on the federal government. There are some non-federal initiatives worth noting, that Kyle touched on. At the National Labor Exchange, there's an online job posting service run collaboratively by NASWA and the **Direct Employers Association**, the association of employers that must check off all the boxes to become a federal contractor and meet the compliance requirements associated with that. There are 4 million job postings there on any given day and they all have text. The research hub would allow researchers to analyze the text, and this is not confidential data. You can look at job title and place, remote or non-remote, etc.

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DATA ISSUES IMPACTING RESEARCHERS AND USERS OF RESEARCH: INFRASTRUCTURE AND PUBLIC-PRIVATE PARTNERSHIPS

NCRN MEMBER: What is the number of new credentials Virginia is looking to add?

HEATHER: 25,000 by 2042. That's in the proposed bill. It may change slightly still but it's in the bill currently.

NCRN MEMBER: Felicia, great job. A couple of new wrinkles to mention. One is Pearson VUE, which develops tests for certifications. They have 500 certification bodies as clients. They expressed an interest in this project at the Association of Test Publishers conference. It's kind of hot off the press here. They want to do a webinar to begin looking at this. The thing to remember is that certification bodies don't report to anybody, i.e., most are unaccredited, and their accreditations are not mandated by government. They don't care whether they report to anybody or not, because they've never seen the return on investment and the cardinal sin in certifications is you never report individual data – that's avoided for reasons related to security and candidates' privacy/preferences, so we have a cultural issue and couldn't ask for a better partner in the National Student Clearinghouse, who is helping with this cultural shift. So, it's not just saying 'oh it's good to integrate certifications into higher education data.' It is a cultural transition we're going to have to undertake for this to happen, which is important.

FELICIA: It is incredibly important. The other way we're continuing to hear about it is needing to identify those individual skills. The industry credentials are as important as any kind of traditional education for learners to be able to map the skills they are getting, understand the return on investment for every one of their education dollars, and how they invest them.

NCRN MEMBER: This is what we want to be able to provide. By the way, the hottest certification in this country right now is the Certified Supply Chain Professional.

NCRN MEMBER: I have a question for Heather: Can you give us a little more information about how you're going to scan or find skills through social media of alumni? What is the method to go find that?

HEATHER: It's two different data sets. For alumni, we're going to be tracking using AI; we're going to partner with a company and we're putting an RFP out for that. Our research director has done this before with his team at Monroe Community College, so we have an example and statewide it's a much bigger animal but we're going to try to do it. We're going to scan what people put out about themselves on Facebook, LinkedIn, etc. about their own credentials. We're interested in credentials, interested in migration, occupation – all things we don't have in our current data sets. It's not going to be perfect. The other data set is a skills data set, and for that we are going to be looking at documents from educational programs like syllabi, course catalogs, etc. We'll be scanning those using AI to collect skills and certificates, micro-credentials, and other things earned in those courses that are documented. We will be working closely with institutions to get to see what's right and what's wrong as we build the data set. I don't imagine everything we do will be right the first time. It will require lots of iteration.

CHRIS: If I may, I have a question, maybe for Heather or the Clearinghouse, it's great to say we're building a dataset but how available will it be to others? Is it one of these state-created datasets where it'll take you four years to get access to it (or never?), or could you just help us understand what's going to happen to that data.

HEATHER: Virginia has a fabulous digital data system, the Virginia State Longitudinal Data System or VLDS, and it is available to researchers now. And our data sets that we are creating - we intend to police them there so they will be available for researchers. There's a system to go about using it, and if anyone is interested in using the LDS, I'll answer as many questions as I can, or connect you with the people running it to can better answer those questions.

FELICIA: The Clearinghouse's Research Center is very anxious for us to get as much data as we can to them so that they can produce reports, and I would encourage reaching out to the Research Center. Afet Dundar is a great resource to reach out to or feel free to reach out to me and let me know what you're looking for -- I can see if we have the data to support it. We certainly don't want it to be four years.

CHRIS: Mark, in your work with states, what questions are driving these three states currently and, in the future, to really start to expand these data sets? For example, what questions are they asking themselves? I ask as a precursor and in terms of thinking about what researchers can do to help inform policymakers.

MARK: I think the inventory and seeing what you know what they have is critically important but also, it's important to look across states. Is there some consistency in definitions? I think community colleges and community college systems want to be able to articulate their story. When the non-credit enrollments are so high, but that part of the mission is so hidden, I think it really serves everybody well to better understand and be able to communicate what those outcomes are. I can't help but think of the adage, "what gets measured gets done well," however, I think in non-credit, there's another way of looking at this, "what gets funded gets measured right now." Heather already alluded to that in Virginia and we see that in other areas where the non-credit data on workforce is under the umbrella of occupational training that is funded. But we're really trying to help understand the data across all non-credit to be able to provide some context and share it. Funding is a driver but telling the story through data is another critical piece and the folks we are currently working with want to do that.

CHRIS: Kyle, how do you see the data repository NCRN is building with NSF support fitting with some of these other efforts like the metadata project?

KYLE: As the data repository is being built by GW's Program on Skills, Credentials & Workforce Policy in collaboration with CREC, the NCRN and PSCWP are slightly different entities. One of the main differences is that our repository will focus on the needs of researchers. It's being built with researchers in mind, and I think that's sometimes a difference, whereas some of the administrative data, some of the state data systems, are built with policy questions in mind. Our questions as researchers are similar oftentimes but not quite identical. I think there'll be complementarity, in the sense that we might find some data sources that are a little more unique. We really have three different categories right now - administrative data sources like state data systems where the individual learner is a unit of analysis; data sets where the credential is a unit of analysis and where the individual certification or license is the unit of analysis; and data sources where the job posting, the opening, is the unit of analysis. What we have now may not even be exhaustive of what's out there and in the coming years. That's a

role for the repository: to hopefully show how these different units of analysis can complement each other and work in concert to answer some of our research questions.

ANDREW: Thank you, Kyle, and to add to that, we're creating this thing and NSF is going to decide if they want to keep funding it, so our project runs through August 2023 and our collective meringue as well, is to demonstrate its value and then have it be an ongoing effort that NSF funds and hopefully GW manages. The NSF is considering itself a primary user of this. NSF has indicated interest in using the administrative data to compare with the survey data and see if there's a lot that could be done there. So, as Kyle says we are really setting this thing up for folks like you. We have a very good project officer, Jennifer Sinibaldi, we have a great mutual understanding on what this thing is about.

3 EMPLOYERS SKILL-BASED HIRING, & NON-DEGREE CREDENTIALS

Five experts joined the 2022 Non-degree Credentials Research Network (NCRN) Conference, *Non-degree Credentials on the Move*, on April 29th to discuss "Employers, Skills-Based Hiring, and Non-Degree Credentials." The panel was moderated by Robert Sheets, lead researcher at the Center for Education and Workforce, U.S. Chamber of Commerce Foundation, and Research Professor, George Washington Institute for Public Policy. Panelists included Joseph Fuller, Professor of Management Practice, Harvard Business School; Kelli Jordan, Director of Career Skills and Performance, IBM; Roger Cude, Senior Vice President for Human Resources, Talent Management and Organizational Development, Humana; and Dane Linn, Vice President, Business Roundtable. **Session slides are available here.**

JOE FULLER: I thought I might offer some early thoughts about why the time is now to make progress on non- credentialed hiring and pivot the way we think about both skills development and hiring towards skills and toward capabilities, as opposed to continuing to rely on credentials that employers have relied on. There are several things driving this.

There's no question there's been a supply shock to the system, and it started in 2018. In my most recent research, we saw a significant pivot away from degree requirements in middle skills jobs starting in 2018. This was augmented by an additional reversal of degree requirements in certain specific positions in demand because of COVID. Many of you will be familiar with the BSN phenomenon — which I attribute to the U.S. News and World Report— because in their rankings of hospitals, they came up with the variable of nurses (percentage of nurses with BSN degrees) as a ranking variable. So, the major metro hospitals decided they had to only hire BSNs. But in COVID, the BS requirement evaporated if you were a critical care nurse. So, demand will certainly respond to constrained supply.

And when companies have been artificially constraining the pool they examine as potential candidates, they are beginning to say: 'I'm just not getting enough applicants. I'm not getting enough people that fit the bill. Let me go back and double check.' I'd like to think some of our research at

Harvard Business School has accelerated that. We published a paper, **Tap the Talent Your Hiring Algorithms Are Missing,** that looked at how the variables viewed in applicant tracking systems to both rank and filter candidates were really constraining. Employers were freezing a lot of people with good job experience and with skills out of consideration. That's why we call them hidden workers — not that they're hiding from work— but they're screened off. They're hidden from employers by the employer's own actions. And the perverse thing about that analysis is that the employers acknowledge they're screening out qualified candidates and acknowledge it's a substantial number of people they end up actively considering who aren't qualified. You can't make this up. There's a process that we know leaves people that would be qualified for the job on the table. If ball bearings were made that way, planes would be falling out of the sky left and right.

Another thing in the supply-demand imbalance is the supply of potential students in academic institutions. Academic institutions are systems that have historically defined themselves more around traditional degree attainment that could come in the form of general studies in community college to matriculate to a four-year degree or could take the form of liberal arts studies in a traditional four-year program.

You're all familiar with the data about how many people go to four-year programs and graduate. When I talk to reunion classes at Harvard Business School and get them to guess what percentage of the population go to college and what percentage graduate in four years, they are way off. We may all think everybody knows this, but everyone doesn't. So, keep saying it to people who are decision makers, because they go back home and all their kids went to college, their kids' friends went to college, their friends' kids went to college. They're less sympathetic to most of both aspiring and current workers. But as the population of students hits that demographic wall in 2026 and, combined with that, we've had a significant interruption of the flow of international students to both two and four-year institutions, schools are going to be scrambling to fill seats. They could do that by continuing to trumpet the legitimacy and viability of their existing programs, or they could expand their catchment in the same way that employers need to, by removing artificial constraints to consideration of applicants by adding the types of programs that have a clear line of sight to household-sustaining earnings levels; and that require things that people have been doing increasingly in the education sector, like using the EMSI Burning Glass (now Lightcast™) data.

We also look at what types of jobs are available locally as opposed to theoretically. More and more community colleges are beginning to engage employers less as a potential donor or contributor and more as a business partner. I'm publishing a paper about this around November. And that, of course, ultimately bumps up against a different wall right down the street from here — the Executive Office building. We're going to have to revisit the Higher Education Act and Title IV of the Higher Education Act. We must expand it, but more importantly, we must get out of a certain mindset in higher education and credentialing where you must earn more than a hundred hours and it has to be from an accredited institution to have legitimacy.

When talking to people on Capitol Hill, you immediately get pushback about for-profits. People don't always recognize that about half of the for-profits had pretty good outcomes. If you want to repair truck engines, you're going to go to a for-profit, right? We must put aside the fixation on the risk of change or that something could go wrong. Because something's going wrong with what we got now. And it's called 44 percent of the workers in the U.S. are employed in low-wage jobs. To me, that's the biggest social justice issue in the country. Some might say, 'Well, how do we know that we won't have a problem?' Or 'How do we mobilize a higher ed community that is really ambivalent about this?'

In my opinion, they also ought to be ambivalent about the outcomes for citizens.

One last thought on this supply/demand imbalance. Unless you get a coherent immigration policy in the US, the acceleration of skills requirements by employers is just going to keep pulling away from the workforce we're creating. I'm not just talking about data scientists and machine learning experts. To the extent our immigration system works, it's more likely to work with large companies. These companies can influence the system, not in a cynical, manipulative way. The communities of technology can rely on globalization now more than ever to get the skills they need. But there is also a large percentage of high school graduates who are, relative to the needs of work, barely literate in digital technologies. So, over time we also must revisit what we are exposing our young people to. We must recognize that in K-12, we largely must invest in technology to automate or make cheaper the way we were teaching in the past. And, in Congress the question occasionally comes up, 'where do Russian teenage hackers come from?' They come from the fact that every high school in Russia has four years of required informatics. Some of them are good students and some are lousy students. Some of them become hackers and some don't. But they're studying network theories, how the devices work, how you code, what's a user experience. So all of these things are coming together to create a moment where advancing everything from diversity and inclusion to the competitiveness of the US economy is going to hinge on pivoting away from these time-honored bases on which we make hiring decisions. And that's going to cause us to have to revisit how we invest in skills development, how we invent institutions to develop skills that allow both companies and individuals to prosper. This is a painful, intermediate-term process of creating a 21st century skill system.

KELLI JORDAN: At IBM, we started this journey around skills-based hiring at the end of 2016. At that time, our then-CEO wrote an open letter about the skills crisis she felt we were entering in America, that we weren't graduating enough students from traditional degree programs, that every company was becoming a technology company. Everybody was looking for the same skills and competing for the same talent. There simply wasn't enough of it to go around. There was growing awareness of "new collar jobs." For us, that meant they weren't traditionally white collar or blue collar but represented a large swath of jobs that required skills or a degree that could be a proxy for that. It really opened the aperture to redefining what was required for jobs in technology, healthcare, design, and human resources. That started us down the journey we've been progressing on over the past several years.

When we think about how we hire, we have started to redefine what is required for a job. In 2016, more than 80 percent of our roles in the US required a bachelor's degree. Now we're down to about 50 percent. We're on a journey that has started to translate into being so much more explicit about what is required. So, knowing that technology is changing, that the half-life of skills is reducing, we've started to focus on the soft skills because those are the evergreen skills. Being explicit about what we're looking for in a candidate and how we're articulating that as part of the interview process has become more and more important. We recognize we can teach you technical skills and remove the bachelor's degree requirement from many of our jobs.

As a result of these changes, we have seen a 63 percent increase in our underrepresented minority applicants. We have seen a 35 percent improvement in our yield of those coming in without a degree. We're averaging about 15 percent of our hires coming in without a degree. But we also need to do things much more targeted. In addition to this organic focus on non-degree hiring, we also started an apprenticeship program in 2017. I think we are on the cusp of the regrowth of registered

apprenticeship in the US, especially in roles that were not traditionally apprenticeable in the past, like technical. We started with a cohort of seven software developers. We're up to about a thousand apprentices across the US in the past four and a half years. We just announced a 250-million-dollar commitment through 2025 to continue to grow our program. Ninety of our graduates are coming in full time to IBM after they complete.

The three tracks we registered with the Department of Labor at the beginning now represent 25 different career paths. We even have a data scientist path. Most of our apprenticeship tracks average 12 months to complete—data science is a two-year track. On the job, that learning approach has been a complete turnaround for so many apprentices coming in.

Some of my favorite stories about our apprentices are the ones coming out of a completely different career path. We had an apprentice named Tony who started working for us in the coffee shop. After high school, he'd been there for seven years. Everybody knew Tony and he got to know everybody else. He asked somebody one day: 'What's it like to be a software developer?' This gentleman sat down with him. And every day after the coffee shop closed at 2:00 p.m., you would see the two of them sitting at the table talking about coding. Tony enrolled in the local community college, got his associate degree, and came in as part of our second cohort and is now a full-time software developer at IBM. He's gone from a job where he served coffee to a job where he now has a career path to grow and develop as an engineer, or an architect – however he chooses to evolve at IBM.

We have tried to make this type of program more accessible to many companies. We found there was much interest, but nobody knew where to get started. So, we've been focused on the coalitions as well. We formed the **OneTen Coalition** because understanding how to change your hiring practices sometimes takes a nudge.

I get asked a lot: 'Where did you get started on this?' And I say: 'I had an easy job. My CEO said we were going to do this, and I didn't have to convince anybody that we were going to talk about apprenticeship or hire people differently.' But a lot of companies were recognizing there just weren't enough candidates to go around, but they didn't know how to have that conversation around how to change job descriptions and hire differently. There has been this fantastic upswing across many companies now realizing it's beyond just an interest, that this is critical, we must do this, otherwise we're not going to find the right candidates.

There are also issues around data literacy in high school. We must start early. Even before this significant push toward new collar hiring and apprenticeships, IBM was a founding partner in **Pathways in Technology Early College High School** (P-TECH) early college and high school technology program. It's a 9–14-degree program and over the course of those six years, students get both a high school diploma and no-cost associate degree in an emerging field. Industry partnership is a core tenant of that design. There's now more than 250 of these schools, and some 23 countries worldwide. We must get into the schools to talk about skills and ensure those are the skills companies are hiring for because the students are graduating out of high school. If those students don't understand technology, their path and trajectory are going to be that much harder.

ROGER CUDE: Our company started about five years ago. This is a journey that takes time. We started at the time when we had to redo all our compensation and job structures and career framework. We redid that and trying to change 50,000 job titles at once is quite an undertaking. At the same time, we implemented a two-part system that reduced 14 different disparate systems based on acquisitions and different things over time into two systems, which gives us a really good view at the longitudinal record of someone's skills.

Oftentimes in companies, you don't get credit for whatever you did before you started with that company. It's on a resume, it's in your career profile, it's on LinkedIn and so forth. But the credit for that gets lost quickly. This longitudinal record makes it easier with the technology we have. We also had a skills inventory. We leveraged IBM's work with the skills inventories that they did and adapted them to a healthcare company. And then we validated those through hiring managers, functional experts, and so forth. And what's interesting about that is you take, say, a data analytics position. We kind of broad- stroked that, but when we started getting into it, there are so many ways data analytics and digital skills are used across the company, in every area. And then there are data scientists, which are at the top of that list, but you have data analysts in just about every segment that we have.

The other thing that we did is work on challenging degree requirements for positions. We got to the point in our process where you must advocate for why you need a degree to be required versus putting it on the job description because it was easy and is what we've always done. As we've worked over time, we've also created preferences for certain types of credentials. I've heard comments about issues with variability, which is true. But I would also say there's variability in college degrees. This is something that can be solved, and companies are solving that through their data and through knowing what's successful based on the track record.

The example I would give you is that the company's been on a journey for several years on cloud migration. Moving everything to the cloud requires a different skill set. So we have tried out certain credentials in cloud-based skills, in cloud engineering, and so forth. Some are more effective for us than others. So that prioritization and curating of credentials is happening in large companies and it can even happen in small and medium-sized companies.

The other thing that's been said is that shelf life and knowledge are degrading so quickly that credentials become important. We've talked about progressive engagement. As a community in Louisville, what we did just prior to the pandemic is start down this path of creating more analytics, jobs, and skilled workers because we got a sobering report. We made the Top 10 list, but it wasn't a good Top 10 list to be on. It was, 'you're in the top 10 communities whose workforce skills will be obsolete in the next 10 years.' We were with nine other cities, so we felt okay, but it wasn't great. As a community, that's when you think about, how skill obsolescence is a real thing. Some areas of the country are going to face this more than others.

We participate as a company in a consortium with the Business Roundtable that has been doing really good work. Many organizations will tell you they're implementing skills-based hiring and skills-based practices, but they really haven't built the shared language and culture. It's more than just changing questions on a questionnaire or interview guide. Some companies think they are skills-based hiring but they're not.

Let me get to a couple of so what's. The talent imperative for companies is becoming much more acute. Talent risk is becoming much more acute for boards and companies that are managed by public boards. In fact, the National Association of Corporate Directors added talent risk to one of the things boards need to be focused on in the last five years. They've added that as a key element of a public board's governance and fiduciary responsibilities. How do you reduce the talent risk that allows you to execute, transform, and grow all the kinds of things that we talk about? The advances in technology are allowing us to better predict skills — and that will continue to get better.

I'd also like to comment on AI and machine learning. Companies really ran down that path, but it was not really looking at the predictability of skills and

success—it was more around automation. If you put your pre-qualifications into your system to automate, it starts filtering out more than you wanted. I think we're maturing in that area where AI and machine learning will be much more focused on predictability and not the downside of screening when it's not appropriate — such as the DEI (diversity, equity, and inclusion) issues that come with that. There are also companies using AI to increase diversity and finding success with that. So that's an area that's going to continue to evolve.

One of the things I've heard mentioned is you must focus on skill development in skills-based hiring with support systems. I mentioned progressive engagement where, right before the pandemic, we were developing data and analytics skills. We created a system where we offered free online mini- courses on data analytics and digital skills. If someone completed that, they could sign up for a partially funded scholarship-driven course. Then they could progress into a paid course. So, there's this progressive engagement for somebody who's motivated to continue to go down that path. How do you create that from a learner standpoint? There's still some learning there, but it was so important to do that exploratory work around the support systems and social determinants of work, as we called it. You hear about social determinants of health a lot. There are many things in someone's life that impacts their health. A person's social determinants of work similarly impacts someone's ability to develop skills. And to understand that we call them soft skills, professional skills.

This is also opening an interesting area where you can get competitive analysis of skills in other companies as more transparency comes. Think about a company that's transforming by migrating to the cloud. It would be very interesting for us to know how many data scientists they have, and if they have 700 and we have 300, then we probably ought to pay attention to that. By thinking about this transparency of skills, you'll be able to get profiles of companies which is going to be very interesting. It's not proprietary information—it's going to be just good, competitive data that you'll have on how deep your skills are and the areas where you really need to have them, based on your strategy for growth of the company.

DANE LINN: I'm going to try to add to the great remarks from my fellow panelists. But let me first say that I was in a meeting earlier this week with many of our state Business Roundtables and the executive director from one of the states looked at me and said to the group: 'Why did BRT start to do this work? Was it really driven by the pandemic?' This work was not driven by the pandemic. It's driven by some of the reasons my fellow panelists have indicated. It's driven by the supply problem we had. It's driven by the inequities we have. If you're not familiar with our work around racial equity and justice, look at those recommendations in Advancing Racial Equity and Justice. This report provides Business Roundtable's recommendations, focused on six key themes: Employment, Finance, Education, Health, Housing, and the Justice System. Although racial bias impacts Americans of color across the socioeconomic divide, large employer efforts are focused on addressing the economic opportunity gap, including disparities in access to good jobs, financial resources and quality education and healthcare. While progress has been made in many areas to curb racial inequities, in many ways gaps in economic opportunity have grown. White family wealth in 2019 was eight times that of a typical Black family and five times that of a typical Hispanic family. These longstanding systemic inequities can have a compounding negative effect across generations, and the trends will not reverse unless all of us – government, business, and civil society – take steps to ensure that every American can participate fully in the economy. The report provides more than 150 examples of efforts large employers are taking to advance racial equity and justice.

3

EMPLOYERS SKILL-BASED HIRING, & NON-DEGREE CREDENTIALS

NCRN MEMBER: You've given us great information about what's driving the changes in your workplace and how you're implementing those changes but how are you getting the word out, communicating to all your talent sourcing partners in the new way that you want to source talent?

KELLI: IBM has formed a lot of new partnerships. We've been working with the Business Roundtable, with OneTen, and with a lot of the coalitions which have really expanded that circle of influence. It brings in community colleges and training providers. We did have a lot of those partnerships to begin with because of the reach our company has with regards to learning, but it formalized a lot of those connections. We've done a lot of storytelling. I think we gained a lot of traction when we started down this path and started to see results. We knew that to grow, even internally, we had to start talking about it. So, sharing the stories of our apprentices, bringing in the data, and talking about these changes helps to get the word out. Capitalizing on all those partnerships has helped to make skills a top priority for IBM.

ROGER: Humana works with few partners very closely so it's a bit easier than having a broad set of partnerships in terms of sourcing and hiring talent. I would also say it's important to form new partnerships. One of the partnerships we have is around apprenticeships. There is a tech company that works with us in a consortium about skill development and skill building. The company hires people who are sitting shoulder to shoulder with advanced tech specialists and engineers, but they're working on contracts for us. So, this tech company is the apprentice model. Ultimately, we get to see these employees in practice through the contracts we have with this tech company, and we have an agreement that if we ultimately want to hire them, we can. So there's this interesting relationship where apprentices are not on our payroll but working on projects, becoming familiar with us and learning from third-party technical experts.

JOE: Humana and IBM are examples of what better large companies can do but they're a small minority. On top of that, the world does not work at IBM or at Humana. A huge percentage of the type of people we're talking about — non-degree holders —work in small and medium-sized enterprises. We have to change entire systems If we're going to reach a big part of the population.

I want to be very clear about innovation and business. Adoption of fair labor standards starts in big companies. It's great that companies like IBM and Humana are doing what they're doing because they have the weight and presence nationally and have the resources to build partnerships. These companies can create a scale effect that gradually starts percolating through other parts of the system. But there is still a significant percentage of the population we need to help to improve their economic prospects going forward. Tony is a great story, but we must think systemically, 'how do we reach Tony's cousins, siblings, and other people like him?' That's going to require rethinking the incentives to companies that can be provided by the state and federal government. It's also going to require thinking about how we can offer re-skilling more broadly than just inside big companies. And it's going to require figuring out how to prepare people better in terms of their social skills. Routine work is increasingly going away through automation. What's left is the work of humans, which is often the ability to deal with highly imperfect, irrational, and confusing assets. I think the question about

communications is very much one about progressive, well-run companies like IBM and Humana and what lessons they can impart to other big companies and their supply chain providers. But it's also very much about how we communicate to other elements of the system to enable a broad-based revolution in terms of path to employability and prosperity.

DANE: You're exactly right, Joe. Only a small group of companies are doing this well. Two of them are at the table. And that is the whole purpose of the work we're doing at the Business Roundtable BRT and in our Multiple Pathways Initiative. How do we replicate, scale, and accelerate change, whether it's the algorithms that have inherent biases in them, or the training programs that many companies don't have? We need to see more hiring programs like IBM's in other companies. So, we're really trying to help companies think about the acquisition of skills, but also the training and reskilling as an equally important advancement. Diversity and inclusion run throughout that. Yes, this is about skills, but it's also looking at the makeup of the workforce as well.

We're also trying to influence companies in the ways they think about career pathways. In this ecosystem, it's not just about rewriting your job descriptions. It's about the entire ecosystem and a critical part of that ecosystem is getting companies to build career pathways. So, as an entry level data analyst, the individual sees the knowledge, skills, behaviors, and abilities they need to acquire to take advantage of the next best job. How do they close that gap between the skills they have and the skills they want to acquire so they can take advantage of that job? How do we replicate the learning portals that companies like IBM and Humana have built? It's not all about going to the two and the four-year university. It's about being able to acquire those credentials on their own time.

I would be remiss to suggest that all the work we're doing with nearly 80 companies at the Business Roundtable out of our 238 members is just about multiple pathways. We are being very intentional, by design, to think about multiple pathways such as our Second Chance — hiring individuals with criminal records. How do we bring them into the fold? We're a Fortune 200 organization, so how do we influence the way our suppliers also look for talent? Oftentimes, those employees make their way up to our companies and are employed by Business Roundtable members. So, it's also influencing those individuals outside of our members.

Another critical part of the connections we're making is immigration. We cannot grow our own talent alone and meet the needs companies have to be competitive. We must be able to recruit those who are coming to this country to take advantage of the opportunities here. A company has virtually no mobility for their employees who are on H1-B visas (via that allows US employers to temporarily employ foreign workers in specialty occupations). There are degree requirements, but you can't meet them.

What we're trying to do is influence the regulatory process at the Department of Homeland Security to see if we can lower that threshold of needing 12 years of experience without a degree to take advantage of any other job in the company, outside the one you have as an H1-B holder. We think there are ways to work with the federal government on the regulatory process. Realistically, we're not going to get comprehensive change anytime soon, but we do think there are opportunities for short, small wins. So, we're going to have a meeting with a bipartisan group of senators and CEOs to work with them over the next couple of months and figure out what we can do through the immigration system for Dreamers and others. That's broader than skills-based hiring in but it's a critical part of the solution.

BOB: I think that the Skilled Through Alternative Routes (STARS)[1] framework does a bit of what both Roger and Dane referred to, which is beginning to think about what skills are required to do a job. And that often requires a company to take a

[1]for more information see Ashley Edwards' remarks in Chapter 6

step, which many, strangely, have not taken – to link hiring practices with data from a performance management system. So, as a hirer, I can begin to see what the attributes are of somebody who succeeds in this job. I often say that most employers aren't doing this. They do the math correctly in the way they've defined the problem, but they do the math incorrectly relative to the actual problem. And when relying on proxies like degrees, the employer's inferring that someone has a skill based on having that credential or they're inferring someone isn't going to be work-ready because they have a criminal conviction. Instead, we must encourage credential granters to emphasize isolating the required skills and highlight those in their curriculum, whether they're soft skills or technical skills. We must start encouraging more employers to think using a skills-based mindset, as they do with the IBM learning system.

KELLI: One of the drivers for us was internal mobility because all of you know this data, but when you ask employees why they leave, many say, 'I didn't really know what the career path was.' Our response to that in the past was for the HR department to map out a bunch of career paths that became irrelevant probably six months later. The other option that companies have said: 'Well, it's in our culture that you need to manage your own career.' And that doesn't help employees at all. That is a very sort of dismissive way to say, 'Yeah, you can do it.'

So, what we need is internal mobility to create options for employees to say, 'What skills do I need to keep developing? What options does that open for me? What is that pathway?' I think that's what Joe was talking about. And a crucial part of that is clearing the entry level deck. There are entry level positions in a company and if someone comes into one of them and stays 10 years, then we have failed. If you're not clearing that entry level deck, you're not allowing others to come in and create an ecosystem within the company. Now I'm talking more about large companies here, but, if you're not creating mobility, then you'll be stuck hiring people at mid-level positions and paying more for those. You'll be hiring people who develop their skills externally and it's not good economics for a company to do that as a practice.

I also want to point out that larger companies have a big pool of internal talent at their entry level positions. And what Roger's describing is how to create an osmosis effect where more of those people know what pathway exists for advancement. There is a paved road with plenty of signage which is going to be increasingly expensive if you haven't been thinking this way at all, and you're simply saying, 'Oh my gosh, I have to get diverse, have to jump into that spot market'. It's going to be expensive and not very credible because your diversity candidates show up and say, 'There's no one that looks like me here.' It's much better if you can start building those pathways and you've got it wired into your systems.

The last thing I'll say is we've seen a lot of people in C-suites that say, 'We have a program that's really effective.' But if you go to the front-line supervisor, they say, 'We're not doing that.' The front-line supervisor evaluation of the types of upward opportunities available to the people they supervise is different from the C-suites' impression. I'm not saying the C-suites are acting in bad faith. They really believe it because they've got a manual.

NCRN MEMBER: If I understand skills-based hiring correctly, what we're trying to do is use the hiring process to match the supply and demand sides of skills portfolios together. So, I'm wondering to what degree do the large firms track if those elements in the job requirement at the interview can predict productivity? And if that exists, how can we share that data with smaller firms that are unable to afford IBM's management practices? And then for us as researchers, how do we crack the wall of internal proprietary data at the business level to bring that into the system?

JOE: It doesn't happen very often and needs to happen a lot more often. There is a hand-off that takes place between the recruiters and the actual

hiring manager. And that hand-off takes place through a trap door between two dark rooms. There's very little data that flows through. All the recruiters know is that: 'We need more of X, and we gave you Jane and Jonathan six months ago.' They don't know that Jane and Jonathan both hated the job and quit, or they weren't any good at it. How do we get big companies to share that data? That's hard because big companies live in the US, unlike a lot of our peer competitors. There's this idea that internal data is a competitive advantage. So, companies don't want to tell anybody about it. If I'm a retailer and I have a 100 percent turnover rate in my front-line staff, I don't want to tell anybody my secret. But I think there are a couple of ways to counter that. First, there is the supplier. So, the more the big companies tell the suppliers, the more information will percolate through the system. And second, there will be the data. You can get a decent read now, at least with LinkedIn level workers, about who your competitors employ. I've done some of the analysis about looking at what other companies are hiring. It's interesting. For example, some of you have heard the phrase "unicorn" for highly valued startups. Who does Tesla look for a product manager versus Ford? It's an interesting contrast. Roger, you brought up predictive analytics. Do you want to share any more about that?

ROGER: We probably have less data now on the time-to-productivity ratio because that's such a short window for some positions and longer for others. We're starting to gather data on performance and matching performance data with skills. And that's interesting because everybody has their own performance systems and it's hard to aggregate that. I believe ultimately, it's going to go the same way healthcare is going, which is using synthetic data to see these patterns. I think we're a few years off from that and it doesn't really get into the proprietary issues.

NCRN MEMBER: I have a comment for Joe and question for Kelli. Joe, as you know, the federal government has issued an executive order that the Biden administration hasn't rescinded saying the federal government will be involved in skills-based hiring. They spent tens of thousands of dollars on a "job analysis" but their competencies were so broad they couldn't possibly hire against it or even develop an assessment tool. All of a sudden, we're going to have skills-based hiring but not understand the science behind it. The question is, how did you go about trying to involve the HR people and getting it specific enough that the competencies and the skills identified are meaningful?

KELLI: That's a fair question because that's what we've heard from so many companies: 'HR is not going to let me do that.' Well, HR might if you can talk to them about what needs to be valued and why it's important. For us, it happened in parts. When we started with apprenticeships, we built out robust competency frameworks and each of those has an assessment criterion behind it.

Just as an example, our software development apprenticeship has 25 different competencies. So, over the course of the apprenticeship, employees are being evaluated on all of those by mentors through the learning that they complete. And we've brought that into the hiring process. We have a robust hiring process in general, that looks at behaviors, values, and the core skills that IBM looks for. We worked with our interview science team to adjust how managers tempered their expectations. In a traditional interview where they may have been speaking with a university student, they would hear examples of internships when talking about leadership opportunities. But we gave them examples of how that could show up differently in somebody who has worked at Starbucks so that they could recalibrate their ways of assessing that skill.

One of the other projects that we took on is looking at all our cybersecurity postings. We had done a piece of work with the Aspen Institute about the cybersecurity workforce. We went back and looked through and recalibrated the expectation around years of experience because IBM and many other

companies were requiring years of experience that were completely different from a certification. We tied it back to the NICE framework so that it was very consistent with what you would start to see in cyber jobs in other companies.

ROGER: We worked a lot on the skills inventory. If you're starting from scratch and trying to invent those, you will come up with very general competencies that don't really have a lot of meaning. We were careful about that, so we literally purchased IBM's inventory and then adapted it to us. It took a lot of time, but it does take time to get it right. We had all the functional and segment leaders validate the skills that we had assigned to the job through the HR processes because we didn't want them saying they had nothing to do with it. The final thing I would say on interview skills is that behavior-based interviewing has a certain technique that you have to use for people to demonstrate their skills during the selection process, not just the interview.

NCRN MEMBER: I'm wondering if there is a need for future discussion, or a National Center for Skills-based Hiring so we don't just have to go to the IBMs. There are regional centers where companies can come and learn about the science and the process that's needed.

NCRN MEMBER: At Jobs for the Future, we're proud to be working with One10 and IBM. One of the things we found is strong commitment from the C-suite level to hiring untapped talent and looking at fair chance hiring and diversity. However, at the level of talent acquisition, the message doesn't carry down. I guess the headline is: 'we've got a stigma problem here.' We need to understand how to get the hiring manager to look at two resumes —one person has a degree and one doesn't —and make a more informed decision.

ROGER: There is a stigma problem and a hiring manager perception issue. We've drilled into hiring managers they need to be the best judges of talent they can. So, if they have two candidates and one has a bachelor's degree or MBA and the other doesn't, they're thinking about how they're going to be perceived in their hiring decision. Kelli mentioned it, but we do the same. We hold up examples of people who are doing extremely well that don't have degrees, and they start to create different cultural norms around what that really means for a hiring manager, because the worst thing that can be said is 'I took a chance.' But you're not taking a chance. You're hiring someone who's got all the skills that you need for the job.

KELLI: I was just going to call it "hearts and minds." The heart is the story and I think many people know somebody who didn't go to college that is highly capable. Those types of stories help to make things real. But then the mind is the data piece. When we do cognitive ability testing in our interview process, there is zero difference in the results between candidates with a degree and our candidates with a different profile, which is important to share with managers. So, there is a lot that organizations have to do to set a top-down example.

JOE: In my emerging degree reset paper, we looked at technology companies who had eliminated degree requirements at the corporate level. But then we looked beneath that at the job postings and up to 90 percent of the postings still had a degree requirement. So, the requirement was lifted at the corporate level but not by the hiring manager. The two companies that stood out for most progress in combating that were IBM and Accenture. We can talk about how technology disrupts employment but some of the technology for pre-employment aptitude testing coming down the pike is good. I think we as humans have both cognitive biases and implicit biases. So, when we get more technology-involved, it shows a significant change in the outcomes of evaluations given to women and minorities for jobs, because employers are just looking at Candidate A's performance on these tests as opposed to Cynthia's.

NCRN MEMBER: I was going to jump back to something said earlier on the clarity around skills.

One area I would like to discuss more is cybersecurity. This is an area where we're seeing companies who previously were unwilling to share their secrets now wanting to come together because the supply problems are so extreme. Whether it's Boeing, Lockheed, or other companies, can we build some of the skill adjacencies that the folks at Burning Glass have tried to articulate? There's a lot of clarity within the sector around what those skills are which will help applicants and help individuals as they move within and outside the company.

NCRN MEMBER: I'm curious about the intersection of education and skills and who is responsible for establishing a vocabulary that can go between them? I was particularly struck by the conversations about soft skills because I feel like we have years of English and History training in K-12, but it doesn't seem like that's providing the kind of skills we're looking for. Then as we pivot toward a more skills-based look at K-12 education, what are we at risk of losing? I was struck by the Russia example. What are we at risk of losing in education if we pivot too much toward skills?

JOE: I think the ultimate person holding responsibility for rationalizing and reconciling the various taxonomies we're creating is the almighty "it." One of the big threats here is that everyone is in a big rush to create their own taxonomy, which creates a Tower of Babel problem. We can see some of the things the apprenticeship-oriented hiring systems did with the Swiss. There are 8,000 employer groups in Switzerland. They agree what a front desk clerk in a hotel looks like, or what a bank credit analyst looks like. In the US, we're not going to get there. I think the employer must reconcile that they're going to have to have a Star Trek universal translator that says, we know what we're looking for, even though it lies behind the fact that New York has a different taxonomy than California, or that this CTE program seems to use different language system than that one.

KELLI: I don't think it's an exact science which is also part of the problem. My response is going to be different from Roger's, and that is where the interview process comes in. That's why we try to be much clearer in our job descriptions about exactly what we are looking for, so that it makes it easier for everybody to be on the same page.

ROGER: One of the things we've tried to do is to bring together the institutions who have the programs in place and look at what skills they are developing for those future employers. In some cases, it's the employers who aren't clear. This is an area where a lot of the work we must do as employers is communicating what the needed skills are. I think the only way we're going to be able to solve this is to sit down and look at what's being taught, whether that's through a career tech program, apprenticeship program, or two/four-year program. Bringing those parties together is one way to try and fix this problem.

JOE: There are interesting developments with vendors coming in to automate the process. We've been looking into the infrastructure necessary to support effective translation. At the end of the day, the translation between the candidate and job has to be validated against performance data. So, we need a data infrastructure that validates translation to be predictive of not only performance but also satisfaction. Ultimately, it comes down to data. We need to train the algorithms with data infrastructure and have that feedback loop go back to the candidate and training provider.

NCRN MEMBER: I want to congratulate Kelli and Roger for being very progressive but I'm not optimistic that it's going to be widespread. In my experience working in Singapore, we have some front-runner companies doing the same thing that you do, but then you get down to the next level, and breaking those levels down and implementing this procedure throughout is risky. So, I'm not optimistic it's going to happen. How do we get a common language? I think mapping is a possibility. I want to throw one idea out there that we tried in Singapore: create a system where employers can put the

CVs of their employees into the system using AI and machine learning and be able to generate a taxonomy that's 80-90 percent accurate. Then you go validate against your hiring managers and make the system available. That gives you a sense of the skills inventory in your company. Then you can aggregate that at a regional and state level and get a sense of where the gaps might be. That might fit in well with the idea of a National Center for Skills-Based Hiring, but until we have something like this, I'm not optimistic that it's going to go to the rest of the industry.

NCRN MEMBER: One company has taken 1.5 billion resumes and LinkedIn profiles around the world and is looking at a skills taxonomy based on descriptions of what they've done. That is moving quickly because I think there's a commercial opportunity that's powering a lot of companies to do this. And kudos to Dane and the Business Roundtable—many companies have pulled together and are creating a playbook based on the knowledge, experience, learnings, and failures —all the things that other companies have done in this arena. It's been a very collaborative effort from companies to do this and they've been very open about sharing that information because the Business Roundtable brings companies together to say, 'This is bigger than us.' How do you do this in a company, whether it's small or large? I'm a member of the **Department of Labor's Workforce Information Advisory Council.** I represent research organizations and we are looking at how the DOL can increase promotion of a taxonomy for skills. The Commissioner for the Bureau of Labor Statistics says he wants to do this so I invite people here to talk to me because I am willing to work with them to make a recommendation to the Secretary of Labor about how Secretary Walsh can facilitate this. But it also seems to me that universities have been caught up in the concept of four-year colleges. Forty years ago, the country really sent a message to high school students that you must have a four-year college degree to get ahead. And that puts universities in a monopoly position. A decade later, GW decided they were going to raise tuition because that's a signal of quality. And the result was that there was a race to raise tuition and the money then got funneled into amenities. That's the business model for a lot of universities now. President Biden is going to decide about whether to cancel student debt and so forth. But what are the implications of that for the current situation?

JOE: That narrative is perpetuated more broadly than just by the education providers. It's a societal narrative that you must go to college to make it in America. Everyone from politicians to movie actors, musicians, and athletes, reiterates that message. And some research I did indicated that the income outcomes for someone that does a four-year degree are essentially indistinguishable once you isolate the top 55 universities. For those people who get into the system, we must do everything we can to help degree completion, which often means providing services and recognizing working learners. What the ivory tower establishments can do is acknowledge why it's such an intractable problem. What we're trying to do in our project at Harvard is to link across the areas of expertise at our university. We're unusually broad in terms of the number of graduate schools we have that are credible in each of the spaces they serve. We have to understand that the way we've approached these problems is inappropriate for understanding them because they're multidisciplinary. As long as each discipline keeps studying the phenomena through their lens, we're going to get good scholarly journal articles that don't move the needle at all.

NCRN MEMBER: We heard some talk about emerging data on Internet job postings, but the vendors are not motivated to supply information about the amount of noise in that data as it's translated from various sources. What do we do to get information about how accurate that data is as more and more people begin to rely on it as "emerging and alternative LMI — labor market information?"

JOE: This is something the federal government could just do by opening the IRS data. And you can see various states like Virginia and Florida, where if you come through their state system you can see some of that information. The feds should focus on making information in the market more readily accessible and accurate over time. And then sit back and let educators educate employers and workers find career paths that they're excited about.

NCRN MEMBER: What's the motivation for employers not to sell their data at the zip code level when it's not accurate? What is the motivation to have these vendors obscure data, rather than selling it as being perfectly accurate, which it isn't?

JOE: What I would say is that it is the best of breed right now. You have to keep creating better breeds and that is going to largely be through the government, which is the only point of aggregation for where you live, what you make, etc. If you have at least some types of credential from a state institution, then you can augment that with the private sector data, as opposed to relying solely on the private sector data. Because that's the drunk looking under the lamp post for his keys because that's where the light is.

DANE: I'm going to take the glass half-full approach. I think we have not just a supply problem but several reasons that are motivating CEOs to do this work and it's funneling down, not just to HR, but many other parts of the organization. Yes, we don't have as many IBMs and Humana's as we would like, but we are starting to penetrate many different parts of the company and that does include the hiring managers. We have an incredible opportunity here and hopefully can build on the successes of IBM, Humana, and a couple of others to not just respond to the current supply problem today but change the infrastructure of the way we look to grow and keep talent.

4 HIGHER EDUCATION AS A PROVIDER OF NON-DEGREE CREDENTIALS

Four expert researchers and practitioners joined the 2022 Non-degree Credentials Research Network (NCRN) Conference, *Non-degree Credentials on the Move*, on April 28th to discuss Higher Education as a Provider of Non-degree Credentials. Moderated by Kenyatta Lovett (Community Foundation of Texas), the panel included Julian Alssid, executive director of Unmudl Marketplace Solutions; Jim Fong, chief research officer at the University Professional and Continuing Education Association (UPCEA); and Christos Makridis, research professor at Arizona State University. **Session slides are available here.**

KENYATTA LOVETT: Prior to joining Educate Texas at the Community Foundation of Texas, I was assistant commissioner in Tennessee in the workforce services area, so my world has been all around the non-degree credentials and how we can advance them to really move the workforce forward. This conversation is about "how can higher education adjust to this interesting wave of non-degree credentials?" I'll just say, from my perspective, because I want the speakers to talk and we can make this a dialogue, is that this is an opportunity for higher education, to take non-degree credentials from a competitor to a potential solution. Whether it's aligning the mission to current circumstances- and we heard about that in the previous panel, how we're building linear models for non-linear realities – or how do we make this a different model. This [NDCs] is a mechanism for affordability, something that been a challenge for higher education. How do you bring non-degree credentials into a new framework that also addresses affordability and gets to the "speed to market" challenge that's so much of a pain point for our employer stakeholders.

UNMUDL: BRINGING INNOVATION TO HIGHER EDUCATION AND THE LABOR MARKET

JULIAN ALSSID: Our model is a marketplace for short term programs, courses that are designed to help someone get a good job or a better one offered by community colleges. Picture, you know, Amazon or Airbnb for community college courses. We were founded by a group of community colleges who were leaders in recognizing that they're competing, not just in their regions but in a global marketplace and, in some cases, having their lunch eaten by others. They needed to find new sources of revenue and enrollments and saw that the hard divide between credit and non-credit and vocational and academic has got to go away.

And so, at Unmudl we, in a sense, lead sort of a little technology arm for these member community colleges that, I believe, has the potential to really transform higher education and the way employers and colleges work. We describe Unmudl as a skills-to-jobs marketplace. I want to share my thoughts about what I would like to see this group be looking look at from a from a research perspective. To introduce Unmudl, we currently have about 10 colleges and about 50 employers that hire out of the colleges. The name Unmudl is derived from the notion that there's workers stuck in the muddle, they don't have the money, don't have the time, don't know the return on investment – they're in the muddle. So, our marketplace is designed to increase the signaling and cut down on the bureaucracy, both for the employer partners that want to work with colleges, as well as learners. We make it very easy for folks to buy courses. On the back end, we deal with the college bureaucracies, we make it easy for employers to kind of work with us to figure out how to build programs with colleges and then how to deploy them through this network. The example I'll leave you with is really the flagship, what we call Unmudl original, which is a partnership with Amazon where Amazon hires (in the US alone) about 1000 maintenance technicians - basically robotics technicians for the fulfillment centers - and they are struggling with filling those positions, with diversifying that workforce. And it's very difficult for them as a big corporation to go college by college, so they came to us and together we started looking at the job descriptions and we really work with subject matter experts at Amazon to understand the skills inherent in those descriptions. With the help of our instructional design team, we basically build a competency-based online, on-demand course that is designed to help Amazon identify people who can move into these into these positions with the idea that there's a whole bunch more training that needs to be done. So, it takes about 10 weeks to get them there, and this is, you know, a job that pay $50,000 a year and up. Oh, by the way, this not just an Amazon. What we're doing with Amazon becomes a route that we can spread within Amazon to cover their pathways but also much more broadly across industries.

So, the way we're doing this is so we begin with a job description and we're building these programs so they can be part of pathways. They are plugged into Amazon's recruitment strategies; their upskilling, their tuition program, their learning development programs - they're all aligned with industry certifications. And the first college, and ultimately multiple colleges, that will be offering this programming or are building them to become part of academic pathways.

I believe that what we're doing represents sort of very grounded and so the idea is we're doing this as Amazon - part of the deal is Amazon markets this. And you know, as they have students start to tell their stories, it's going to be a good story and it's a story that they really want to tell, especially as they move people from frontline, physically demanding jobs to pretty good career-track jobs. I believe that you know there's a lot of talk about the skills

ecosystem, and I want you to know that we're an example of how you build a skills ecosystem from the ground up.

Now, on to what sort of research I'd like to see. What I'd like to see is someone take a holistic look at this approach to providing credentials. Unmudl wouldn't necessarily have to be the organization this sort of research would profile, though we would love to be able to contribute to the research. We need research on everything, starting from the job descriptions to the training, and how the training has been designed to address the job descriptions. Then we need to look at the supports and services that are needed; we know so many people are not going to get anywhere if they're at risk of getting sick without medical care; we don't have the supports in place and many other services. Alignment with upskilling matters, so does alignment between certifications, degrees, college credit, and pathways. Recognition of on-the-job learning is so important. Once they [Unmudl completers] come out of our program they still need a bunch of work to fully learn the job, which is why most employers will say "bring me someone with basic skills, we will do the rest." Well, how do we measure that? How do we grant credit for whatever learning continues after labor market entry or reentry?

UPCEA'S SURVEY OF EMPLOYERS

JIM FONG: I'm the chief research officer of UPCEA, the University Professional and Continuing Education Association. We're over 100 years old, and our mission has shifted over time. It's moved from a focus on continuing education to extension many years ago, and then around the 90s we really started to jump on the trend towards online degrees. And it keeps morphing. In 2015 I was charged with starting to conduct research on this phenomenon of alternative credentialing thing. It's amazing how it really dovetails with the interests of the younger generations. We've invested a lot into analyzing it, we said that in 2025 or 2030 we would reach a point where the fully online professional master's degree environments are probably going to reach a point where supply and demand are balanced. We figured that at that point we're going to have something different, and then we have this demographic cliff that's coming so we thought, by 2025 or 2030 this alternative credential things starting is going to pick up speed. And then the pandemic hit and changed everything. Pre-pandemic, we were starting to plan on this and then, when the pandemic hit, the leadership said we need to figure out how to help our members be successful after the pandemic passes. And we didn't know if the pandemic would last six months, a year, two years, but we know that there's going to be chaos there, we must minimize this chaos and really position member institutions for success. And so, my research group was doing a lot of custom research before the pandemic, we were looking at "okay, what's the market like in the central part of the US for a master's degree in data analytics," for example. We would do that work. We shifted and we shifted quickly because we needed to help our members along the way, and so, for the past two years, we tackled a number of issues in a lot of different ways.

So, for this work we surveyed 1000 employers to find out what their perceptions were. I'm here to tell you about this effort today, and about all the research that we've done that we're making accessible to this network.

Like incremental credentials, I heard was really kind of cool too, but we don't know what we're going to call it, we fight we fight with ourselves all the time about what we're going to call it. We can start by looking at a recent report from Modern Campus. They gave a little bit more influence on this because

they had a longitudinal study, but one of the things that we found out from our 205 institutions that completed the survey is that two thirds them are doing some kind of alternative credentials, and they've been doing such credentials for a while. They [pre-COVID] were doing it, but the volume wasn't there, it was less than 25 percent of gross revenues that a continuing education unit was doing. There was also a study from Cengage that found that for the average institution offering non-credit, they had an average of 257 courses that don't equate to credentials, but it's a much bigger portfolio now, whether it's offered internally to the institution or through a third-party provider.

So, one of the things that we did throughout the pandemic was a monthly poll. We just tried to tackle one issue at a time, whether that was marketing, staffing, or something else. In a State of Continuing Education report published with The EvoLLLution, we found that 2/3 of continuing education units were very important to their institutions but they didn't feel appreciated as such. Universities know they need to change their programming mix to generate new revenue, but they're not funneling money accordingly. I realized that if they want to make money, they must pay for it. Now, regarding the study we conducted with support from NCRN and Strada - we did a study and just released it a few weeks ago. We studied short-term credentials and the business and industry that support them now. I will tell you, we did a study in 2018 with multi-generational managers and that was not the case; they didn't know what alternative credentials were they didn't they didn't appreciate badges outside of the technology and business fields.

That is shifting is based on what the studies are showing, and so there's a lot more value there from the employer's perspective: you'll see that 80 percent of businesses find some sort of value in non-degree credentials depending on what the parameter is. So, there's a lot of good evidence of value here in terms of the route in terms of the study. We deal with it from a multi-user perspective when we do research; we talked to a lot of end users. For example, we'll talk to 1000 people who quit college, or we will talk to 1,000 businesses, but we survey our own institutions pretty regularly as well.

And so, now that we've got three major pieces of the puzzle, and then we overlay labor data, which allows us to influence decisions within our community and with policymakers. We did a snap poll. We asked, what audiences are you serving? Choices included adult learners and corporate audiences and then we also ask them, for each audience, is enrollment increasing, decreasing, or staying the same?

One insight is that over 40 of our member institutions are getting involved with incarcerated populations through prison education initiatives, and so "Second Chance Pell" is starting to become very, very real for a lot of institutions. Another audience that we found that institutions are targeting is alumni. Alumni has always this bastion of wealth here that you're not allowed to touch, and indeed we found out through our research is that about 50 percent of our members are not allowed to engage their alumni with continuing professional education. That's going to change and so that's how we use some of this research – to say that alumni, especially younger generation alumni, want to reconnect back with their institution beyond just being asked for money. They're very brand sensitive, brand loyal and so they will engage with their alma maters.

We're about ready to release a white paper on mature learners. We're talking about ages 55 and over. We surveyed around 600 mature learners and found they broke down into four segments. First, there's the 55 plus person, such as myself, that is still employed but wants new skills. Then we have the person that doesn't want any education, that is happy without learning new skills. And then there's two other segments. There's somebody who's retired who wants to learn for personal enjoyment, maybe about the Civil War or photography, and then there's a similar segment that priorities personal interests but may still be in the labor market.

We have another popular report on disengaged students. We lost over a million students over the course of the pandemic, but they didn't just disappear. They sat on the sidelines and two thirds of them are men. And we learned a lot about them: who they are, and what their behavior is like. We have a lot of young men that drop out. We found some interesting insights about them – for example, which social media platforms they use. They're not on Snapchat, but they are on YouTube. We're asking how you reconnect with them, what do they value? On the other hand, women are staying enrolled. They understand the long-term pay gap they face and the importance of completing their credentials.

Like the speakers on Credential as You Go, we're doing some design thinking about how you redesign the degree from the bottom up. We're striving for a stackable credential model. It's very aspirational, we run into problems that you can probably imagine like figuring out how non-credit stacks, trying to unbundle the degree and get stackable credentials. How do we get our member institutions to incorporate comprehensive learner records? All these questions are big challenges. But we're going to try to tackle them and see if we can move the needle, whether it takes six months or six years.

NON-DEGREE CREDENTIALS FOR EMPOWERING PERFORMING ARTISTS

CHRISTOS MAKRIDIS: We all know that education debt is a big problem for many Americans. Even after accounting for financial aid, a lot of the individuals suffering from huge student debt are art students. Yet, year after year, people are going through arts programs and racking up debt, only to struggle to find jobs after completion. Indeed, 66 percent of recent art school graduates are carrying substantial debt; and 75 percent of artists say that they need some type of entrepreneurial training. You might be a performing artist and getting the right vocal training when you're going to college or the conservatory, but you're not getting the sort of skills you need to manage an agent, have a social media profile, or have basic financial literacy skills. This is hurting a lot of people. This is a challenge that non-degree credentials can help with.

I'm going to present some analysis from the American Community Survey (ACS) to try to understand how artists have fared in the labor market, what role arts entrepreneurship programs might play, and how much arts entrepreneurship curriculum exists for students today. Then I'll go into practical solutions for embedding non-degree credentials into the curricula through partnerships with higher education institutions.

Starting in 2009, the ACS started to report individual respondents' fields of study and degree levels. So, studies can restrict their research sample to people that have a college degree, and then you see what type of degree they earned. A couple of major results emerged from this study. First, those with BFA degrees are about 1.4 percentage points less likely to be employed relative to their counterparts that also have a college degree but not in the arts. This is controlling for other covariates: age, race, gender, geography, and so on. Second, they have about 19.5 percent lower hourly wages across all occupations, so it's a significant difference in how much they're earning. And if they are working in an arts occupation, they're earning a little less, roughly one percent less.

Entrepreneurial skills are very important for working as an artist in the U.S., Often you're a freelancer. This is different in Europe. Germany, for example, uses a "Fest" program where you're employed by the state, so artists have a predictable stream of income and a place to live. That contrasts with the U.S. approach where performing artists are generally freelancers – so thinking like an entrepreneur is a necessity, not a luxury. Lastly, and this is one of the very optimistic results in the analysis that follows,

those with some business administration exposure —-maybe through a double major —-do not see any difference in employment probabilities. They are earning more than their arts counterparts who did not study business. This suggests that some exposure to basic finance, accounting, and marketing is helpful in producing these skills. Again, these results are not causal but they're still controlling for the basic demographic characteristics you think of as sources of bias; and because the ACS allows us to see occupation, we can look at and compare people with slightly different degrees in the same underlying occupation.

With support from the NCRN grant, we hand-collected data from all the major colleges and music conservatories and looked at the actual curriculum. We asked, is there anything in the curriculum that's requiring some sort of arts entrepreneurship? Do they have a certificate program? Do they require anything? Unfortunately, only about 5 percent of colleges have an arts entrepreneurship certificate; and 11 percent have some requirements related to it. The music conservatories are doing a bit better — it's closer to 18 percent; and 46 percent have some classes on it. But when you go to a lot of the top U.S. colleges, they don't have any sort of requirement around it and if they do, it's perhaps only one class. While the music conservatives do a little better, they're still smaller and most of the students graduating every year are going to the colleges, not the conservatories. This pattern suggests that there needs to be a greater integration between the underlying practitioners that are forced to be entrepreneurial and the pedagogy in the universities and how can they work together

I want to mention another project I'm involved in, Living Opera. We're a web3 arts and technology multimedia company that also produces educational curricula that augments the training that learners receive at a college or conservatory. We cover topics like working with your agent, managing your social media presence, how you get booked for jobs, and financial literacy. Some singers are surprised

when they take an international job where they don't know the tax rate and suddenly 60 percent of their income is missing. That's crucially important because if a singer goes into a job thinking they can spend a certain amount, but then only receive a much smaller amount when the contract is over, they will get in debt and have a tough time digging their way out of it. These are very practical things that fall into the category of arts entrepreneurship. We're building a three-part certificate program that includes an assessment and virtual interaction to ensure that graduates from this have absorbed the content; and then we'll complement it with the existing curriculum that might exist from a traditional university.

We're also conducting a survey, the Global Well-Being Among Artists Survey, and getting interesting results we can't get from federal datasets, like the American Community Survey. At the end of the day, we need data, and the SOC codes are not detailed enough to provide data that gets at the differentiation that exists within the arts.

To conclude, we believe there are ways for colleges and practitioners to work together to ensure that arts graduates are employable.

4

HIGHER EDUCATION AS A PROVIDER OF NON-DEGREE CREDENTIALS

KENYATTA: Thank you for highlighting important issues. I want to address an internal tension in higher education that Christos inadvertently raised which he said "degree" and "went to college." We have this divide where non-degree credentials are looked down upon as not being a full educational experience. So, as we think about higher education providing non-degree credentials, what do we do about the internal bias in the production system that makes them lesser and then assigns them to people perceived as good enough for such programs - when you're [as a policymaker or higher ed leader] at the same time sending your own kids to a four year institution So, how do we reconcile this tension, so they're not up against each other, but can be more seen as complimentary. I think the Credential as You Go model demonstrates one way to do this.

CHRISTOS: Thank you so much for raising this and I wholeheartedly agree. I'll give you a short answer, and then I welcome other responses. This is how one of my colleagues was starting her career, she was going down the traditional track and music education, she was set up to train at a great school and then she got cancer and she recovered and but then she just she had a tough family life, moved to Europe and basically was discovered in a living room after she impressed somebody – so very unconventional. I mention this story because one of the things that we're seeing in the arts is this looking down upon people with unconventional careers, but all of us to some extent have unconventional careers, right? Musical talent can be measured, it shouldn't matter where you trained or who you studied under. A lot of people get caught up on the paper, the degree, and it's maybe hard to convince someone because they're vested in a particular way of doing things. But if you demonstrate social proof of your abilities via other mechanisms and you build a social media following you can get validation via visible metrics.

JIM: Great question; I think it's going to fix itself over time. I think some of that tension comes down to the creators of the degree protecting the status quo as opposed to having alternative and other pathways into a career. I think that's one of the models that we had at UPCEA. The truth is that there's a lot of gaps; degrees cannot keep up with this new economy. As you build out credentials here it's going to be an onramp that will help sustain that degree, because right now the demographics and the economics over the next 5 to 10 years are not very favorable; the 18- to 22-year-old is not going to be able to pay all the bills for a bricks and mortar institution. So other credentials are going to have to emerge.

It's helpful to think about the community college perspective. Some employers don't even know what community colleges are, let alone how to reach them. So, we're building these connections that would never otherwise exist and then trying to elevate the workforce offerings within the community colleges, even if the leadership of some community colleges is more centered on the academic side of the organization.

NCRN MEMBER: Thanks so much, Christos. Your presentation made me think about one of the underlying assumptions that we're having with a lot of our conversations, which is that "if only we could uncover all the hidden skills that people possess, we will naturally find all the people that have the skills to fill the jobs that we need and

then, our employment problem will be solved, both unemployment and underemployment." But I'm thinking about your example of opera singers. What happens if we microcredential all the skills and it turns out that there's more people that want to be opera singers than there are people that want to pay to listen to opera singers. How do we deal with that with that problem? I think it's not only about uncovering the kind of hidden skills that folks may have but how does society deal with people who may have dreams, aspirations, and goals that don't necessarily fit with employer demand.

CHRISTOS: It's totally true, and I mean it's a supply and demand problem. During lunch some of us were talking a little bit about the role that counselors play in the process of cultivating people's interests and what they're exposed to, and when do whether they understand what a career in each occupation is really like. I mean, a lot of teachers and professors are not honest with art students about what a career in the arts is really like. People are surprised when they're freelancing and they're going from country to country, and they don't have a home. People don't understand what's it like just not to have a home and always be traveling out of a big suitcase and not knowing where to file your taxes because you've performed in 10 different countries, and so I think one thing is just to be honest with the students. Though obviously it's a problem that there's not enough counselors to go around.

Another issue is higher education institutions' responsiveness to labor market demand because right now, I think the number is, according to the BLS, something like 30,000 new opera singers and musical theatre graduates are being produced annually. I think universities have a responsibility to be responsive to market demand, and so, if their graduates are not getting jobs, then they should look at the market and maybe pull back, maybe assess the curriculum a little bit more and, so this goes to Jim's comments about understanding and engaging with alumni. I think that there's a lot of elements there, just in terms of understanding what people's experiences have been and then making updates to the curriculum. But it all comes down to supply and demand, and if there's a mismatch then there will be consequences.

NCRN MEMBER: I wanted to go back to what was said earlier about the speed at which these programs can get up and running and offered to students. I've done some interviews with workforce administrators at community and technical colleges around the country, and they also talk about speed, the way they market to the students, the speed with which the students can take the program. We've even seen colleges have brochures saying a program is just one day; they organize their brochures on the rack by how long the programs are - less than a month, less than four months, less than six months, and so on. It must really resonate with their potential students since they're referencing it so much in their marketing. So, just wondering, Julian, are you seeing that in your work with Unmudl?

JULIAN ALSSID: Definitely yes. I think the speed is important. It relates to how we can build and push out programs, I also think it has just so much to do with the notion of like hidden skills. To me it's less about hidden skills than people need. People learn in many ways, so, you know, it's about reaching people where they are and letting them learn in different ways and validating their skills. We need to break community colleges out of their molds, help them experiment with different ways of teaching.

NCRN MEMBER: I'm thinking about what economists would call general equilibrium effects. I'm thinking that maybe there's finite demand for opera singers; the most entrepreneurial, whether by training or by nature, are most successful – but if we give everyone entrepreneurial training, then the premium for that would really go away at that point. I think it's a general point about what happens if we saturate the market with micro-credentials. If everyone in the market is equally skilled, then

differences in labor market would go away and then that would feed back into the supply and who decides to go into a particular occupation.

CHRISTOS: Definitely, general equilibrium effects matter here. The reality is that there's just a lot of singers that are thrown into the marketplace; they graduate, and they're just not prepared around financial literacy, around managing agents, and so on. Certainly, if everybody had entrepreneurial skills, some of the differences would be a little bit diluted, but also you can also expand the market, the size of the market. And one of the things we're doing with Living Opera is connecting blockchain with classical music. There's a ton of web people who are fascinated by Mozart with whom we're working on a generative art project, where we have the portrait of Mozart and then we have different backgrounds, different wigs, different props. The point is that if you're teaching people to be entrepreneurial, they can change the market and crate demand for new products and services.

5 INTERNATIONAL DEVELOPMENTS IN MICROCREDENTIALING

Five international experts joined the 2022 Non-degree Credentials Research Network (NCRN) Conference, *Non-degree Credentials on the Move*, on April 28th to discuss International Developments in Microcredentialing. Moderated by Holly Zanville, the panel included Michael Fung, Executive Director, Institute for the Future of Education, Tecnológico de Monterrey (Mexico); Margo Griffith, Head of Business Development, Edalex (Australia); Jackie Pichette, Director of Policy for Research & Partnerships, Higher Education Quality Council of Ontario (Canada); Hanne Shapiro, Hanne Shapiro Futures (Denmark); and Thomas Weko, Senior Analyst, Organization for Economic Co-operation and Development (OECD) (38 member countries).

Session slides are available here.

WHAT KEY TRENDS IN MICROCREDENTIALING ARE YOU SEEING IN YOUR NATION OR THE VARIOUS NATIONS IN WHICH YOU ARE WORKING? WHAT ARE THE TOP DRIVERS FOR THESE TRENDS?

MICHAEL FUNG: My comments will focus on my work in Singapore and countries in the Asian region plus Mexico. Regarding trends, there is growing recognition that a first qualification (e.g., degree, diploma, or technical education certificate) is not sufficient for an individual to stay employable throughout their life. That realization had been creeping in slowly, but the COVID pandemic has really brought this to the fore. What we are seeing is several countries where there is propensity for coordinated central action trying to address that issue. These systems tend to develop faster from the supply-side. We have been observing the US as well. There is a lot of private-led innovation in the US, but federal or national systems are difficult to coordinate in the US context.

As an example, Singapore is blessed to be a small nation with a history of coordinated action across the government. Singapore can link economic

needs to educational strategies, to manpower labor strategies, and weave in a multi-stakeholder system to look at it at the ecosystem level. I will not say that we solved all the problems because the problems are still very salient. This is an ongoing challenge, but we have managed to build sufficient, critical mass across the universities in Singapore, in addition to the private training providers. The higher education sector — the universities, polytechnics, and the Institute for Technical Education in Singapore — now occupy more than one third market share of the workforce skills development industry. It took a lot of pushing to get the universities to participate substantively in this space. They have had to set up distinct entities to focus and be effective in this space.

What was helpful was establishing national skills standards, in the form of national competency standards. We call this the Workforce Skills Qualification System in Singapore, and we also developed a set of Skills Frameworks to define jobs in various industry sectors, and for each job to define the competencies, both technical and horizontal competencies, and then link those to learning opportunities whether they're provided by institutes of higher learning or private training organizations. We also involve industry companies to do their own training in-house and for industry leaders to offer training at an industry-wide level. We work with industry champions like Siemens, Bosch, Microsoft, and Google to bring that kind of training into the system.

There are other relevant trends around the world. South Korea has a National Competency Standards system which is enabled through coordinated central action. In Hong Kong, we are seeing the qualifications authority starting to look at how to recognize microcredentials as part of the Qualifications Framework. There is also a host of private providers playing in that space and being quite successful. Across universities, we are seeing some movement to incorporate microcredentials as part of the regular curriculum. So, recognizing or adding non-formal learning and other types of qualifications into the curriculum design for traditional students is a trend.

At Tec de Monterrey, we have moved our academic regulations to allow for the recognition of alternative credentials and microcredentialing. Our schools and faculties are now able to undertake work in reforming their curriculum. This has implications for the future of education. We are championing lifelong learning because we truly see that it is part of what future education will look like. If we want to widen access to different segments of learners in the population as well as address inclusion elements, we must make headway in our integration of alternative credentials and lifelong learning opportunities, and to be able to measure and assess the effectiveness of these innovations so that they are justified and sustainable.

TOM WEKO: Rather than looking at trends, I am going to comment on variation in the cross-section among nations, to focus on what is the current state because we work with about 40 countries across the OECD. Of course, the simple answer is: "My God, it's incredibly variable!" One of the big drivers is the demand side, i.e., do enterprises recognize and reward the acquisition of additional skills and their validation through alternative credentials? As example, Japan does not right now. They have a very different model of continued skill acquisition, and it is firm based. So, we see a system in which alternative credentials haven't emerged, they're not a prominent feature of the higher education system in some nations. This then looks dramatically different than one would expect to find in the US. And that's perfectly understandable given the nature of the way in which their labor market functions.

We see in low-skill economies weak employer demand because they expect to undertake the training themselves and the further acquisition of skills, the refreshing of skills. We work with countries that have low skill economies. If you are working with Portugal, as example, you see a lagging state in

the development of alternative credentials because it's a low-skill economy and the reason you do not acquire and validate additional skills is that the firms and the enterprises do not have the capacity to reward those. There is demand for skill acquisition, but it looks quite different on the supply side where there is great variation. Because we work with higher education systems, there is huge variability in their capacity and willingness to engage in the creation and provision of alternative credentials. We have some countries that do not function in a highly commercialized higher education sector like the US does. The share of revenues in a higher education institution that come from non-governmental sources in most countries is very small. So, you do not have institutions that are autonomous. Higher education institutions are not accustomed to working in an enterprise and commercialized environment. And they are not engaged, therefore, in development. Then we have another set of countries we work with that suffocate innovation. I am thinking of Hungary, where the higher education sector has been absent from innovation for skill acquisition and validation because it is paralyzed by regulation.

The result is an incredibly variable landscape where there are many important national initiatives underway. There is employer demand, where employers are willing to recognize and reward the acquisition of further skills that are somehow reasonably validated, and the institutions are willing suppliers because they function in a highly autonomous and reasonably commercialized environment. And they are running on a small scale. Ireland is an example. They have built for themselves what is probably going to be the first mature policy environment where you've got microcredentials embedded within a national qualifications framework. They will soon be embedded within the quality assurance system of the country and there is a financing stream dedicated to those through a variety of programs and eager willingness on the part of higher education institutions to make that offer. Within the European higher education area and specifically the member states of the European Union, there are significant efforts to create a super national policy framework around that. The European Commission is about to come out with council recommendation, and though it lacks primary legal authority, it's doing its best to push countries towards the development of a common approach to microcredentialing and to use a standard set of descriptors within which those are offered. This is a distinctly European approach to microcredentialing. That is some of what we're seeing around the world.

JACKIE PICHETTE: I like Tom's distinction between demand and supply. I am going to focus mostly on the supply side, looking at the drivers in Ontario, Canada, for the development of microcredentials. The first is very much aligned with what Michael noted, workforce development. Our governments at both the federal and provincial levels in Ontario are very interested in facilitating lifelong learning opportunities and supporting adult learners in particular, whose work may have been disrupted by the pandemic. Prior to the pandemic, mega trends like digitization and globalization were already driving a real interest in supporting adults to advance or pivot in their careers with short, focused training programs like microcredentials. Our federal government is supporting that by providing financing to students directly for microcredential programs in the form of a Canada Training Benefit. The Ontario government is also working to provide financial assistance to students that can be used to access microcredential programs. They are also funding microcredential development, with a view toward workforce development. For example, the Ontario government is supporting the development of microcredentials for the automotive industry, helping the workforce adapt to new technologies and advanced practices like electrification and robotics. As another example of investment to support workforce development, in response to the pandemic, our federal government is investing in microcredentials to train laid off hospitality workers to pivot to other industries.

Another big driver in Ontario is the need to respond quickly to social and economic events that are occurring. The pandemic has accelerated the need for skills training. We are seeing microcredentials being used to train personal support workers because there was a huge deficit in Ontario of people with those skills. How do we quickly retrain people to fill those roles? There are also microcredentials in the dawning and the doffing of personal protective equipment and other COVID-19 precautions in healthcare. The Ontario government has created a challenge fund which is supporting the development of microcredentials, and many are pandemic related.

The other social need we are seeing microcredentials being developed to respond to is equity and inclusion. Reconciliation with Indigenous communities is an important priority in Canada. We are seeing quite a few microcredentials developed to that end. And, on the heels of the Black Lives Matter movement, we are seeing a lot of microcredential funding going toward the development of equity, diversity, and inclusion practices in specific workforce settings.

So on the supply side in Ontario, we are seeing investment from our governments to spur the development of microcredentials that are aligned with those two drivers -- workforce development and responding to current events. Whether increased supply is being met by demand is another question and something we'll need to assess.

HANNE SHAPIRO: I'll be talking about the European approach because I was researcher and consultant for that process. The European Commission has played a key enabling role, but its member states have the autonomy to decide. So, there is a careful balance. In Europe, it is very much about the digital economy, the green economy transformation, and that must be inclusive. The focus is about different types of lifelong, life-wide learning. The EC put together a working group, I prepared the background papers and the final report on a European approach to microcredentials, that includes a definition that can accommodate all qualification levels relating to the European qualifications framework but is also inclusive in that it also can encompass non formal and informal learning outcomes. The outcome of this process was several building blocks, not only covering EU but the European Higher Education Area — in total 48 countries. This way of thinking about building a space with common standards is possible in Europe because within higher education we have reached quite a lot of standardization through the Bologna process. We have qualifications frameworks, quality assurance schemes, recognition schemes, etc. The European sectoral organizations are coming together. For example, the European Battery Alliance is introducing microcredentials to deal with the greening around batteries and embedded in the European Institute of Technology and those networks. On the other side, there is the European university alliances which is also a means of creating scale and push to creating a framework for creating these, but also repositioning higher education as an actor in higher education ecosystems with higher education as a public good. This is a driver to reposition a connect between research innovation and learning through open models of collaboration with companies and building microcredentials around authentic innovation problems in companies.

Looking to specific countries in the EU, Ireland has at present the most elaborated strategy underpinned by partnerships with the regional and sectoral skills councils. Finland is currently implementing a reform for continuous learning aiming to promote learning at the workplace, which acts as a driver to spur greater coherence between informal, non-formal, and formal learning exploring how microcredentials can be deployed as a means to making skills visible regardless of how they were acquired. Spanish universities have considerable experience with the development and provision of MOOCs, and several of the universities have joined forces to explore the potentials of common digital infrastructures.

MARGO GRIFFITH: Non-degree credentials are alive and well in Australia and whilst not flourishing yet, they're picking up speed. We had some early first movers in the world of microcredentials pre-pandemic – Deakin University and RMIT University paved the way early on with their industry aligned non-award credentials. These were in the post-professional space. Several higher education institutions and some organizations followed suit, however the pandemic heavily impacted both our formal learning institutions and our economy due to our closed borders. This meant those organizations that had created strategies around non-award credentials had to wind things down and are only now getting back to putting their structures and strategies in place. A report from the National Centre for Vocational Education Research (NCVER) published in 2021 established that 52.2 percent of employers provided unaccredited training for their staff and it can reasonably be assumed that microcredentials formed a large part of this training. Add into that the microcredentials offered by the vocational training sector, industry associations, professional bodies and businesses and we have an emerging alternative credentialing market but somewhat chaotic.

Many of the drivers in Australia are historic and specific to the nature of the formal education system in our country, even though microcredentials are primarily in the non-award space. This is because in Australia we do love ourselves a framework and have several. For credentials to have currency in our market, many people feel they need to be viewed and aligned within the context of national qualifications frameworks. Australia's formal education system is highly regulated. We have national frameworks for all sectors – a national curriculum in K-12 and the Australian Qualifications Framework in postsecondary education. We have national regulators within each sector to ensure quality. This has served us reasonably well historically but the rapid global economic, social, and technological changes have meant that our highly regulated system has stifled the required need for innovation and change needed meet our future job requirements.

This was recognized by the Government pre-pandemic who commissioned a series of reviews into our Vocational Education and Training System. The expert review by Steven Joyce put forward 71 major recommendations for reform, the majority of which were accepted by the Government and are now starting to be implemented. The first initiative to appear is the National Microcredentials Framework which was published last month. This framework seeks to: set a national definition for microcredentials; agree on the unifying principles for microcredentials; establish the critical information requirements; and outline a minimum standard for microcredentials that will sit on the National Microcredentials Marketplace. It is a relatively benign piece of work that is broad enough to enable innovation but narrow enough to fulfill requirements.

The second major federal initiative is the National Microcredentials Marketplace. This has not been released yet, however, early indicators point to the marketplace only being designed for higher education providers. This is problematic on several fronts. First, it will be largely irrelevant to most learners in Australia if this is the case. Second, it flies in the face of all the credentials currently offered by businesses, industry bodies, and professional organizations. And third, it flies in the face of the Heads of Agreement for Skills Reform signed last year where the Prime Minister and the State and Territory leaders all committed to "developing and funding nationally accredited micro-credentials and individual skill sets, in addition to full qualifications, and supporting lifelong learning through an integrated tertiary education system".

So we have initiatives that are moving in the right direction but are still too limited in scope to really serve the future needs within our country. Where does the future lie? I believe it to be in Skills and

open data standards. I think we need a blurring of the artificial barriers between and across our formal and non-formal education sectors and visible and open pathways for our learners to navigate. I believe skills can form the building blocks of this. Our Vocational, Education and Training sector in Australia has a 40-year history of competency-based education with a library of literally tens of thousands of skills. This is all locked into the Vocational sector, but we have this treasure trove of skills waiting to be fully utilized. There are pockets of wonderful work being carried out by Federal and State Governments, major corporations, professional bodies and smaller players around skills, but it needs a coordinated national conversation and action plan. One of the most important papers to be published recently was by Martin Bean and Peter Dawkins. In their paper, they list Seven Short-Term Actions and Four Longer-Term Directions which the Australian government, higher education providers, and industry can take to promote greater collaboration. Included are development of a National Skills Taxonomy; implementing proposed Australian Qualifications Framework (AQF) reform; a unified credentials platform; industry-focused microcredentials; cadetships; work-integrated learning; and cross-sectoral partnerships. My wish is for many of these recommendations to be implemented and a flourishing, integrated credential marketplace be established to provide visibility around skills for those at the center of this ecosystem – the learners. The bridge, of course, between all the stakeholders will be robust and relevant non-degree credentials working with our formal education structures.

HALF OF U.S. ENROLLMENTS OCCUR IN COMMUNITY COLLEGES AND THESE COLLEGES TYPICALLY HAVE A STRONG WORKFORCE AND SKILLS ORIENTATION.

> Are universities and community and technical institutions being impacted in the same ways by microcredentialing trends?
> What are you seeing in the nation or nations you most closely work with?

HANNE: Regarding vocational education and training, the scene is much more diverse in Europe than in higher education. I'm currently involved in mapping micro-credentials in the broadest sense in the context of vocational education and training and workforce development. There is concern that if we begin to have microcredentials, could it then mean an unbundling of qualifications? In particular, in those countries where we have strong apprenticeship like Germany, Austria, Denmark, and partially in France, apprenticeship has a breadth and depth and a holistic conceptualization and a broader focus on general workforce capabilities than the U.S. apprenticeship model, and they also typically have a much longer duration. And in a 21st century skills and automation context, what if qualifications are unbundled? What will that mean regarding the notion of being skilled? And what are the implications for negotiations in labor market and collective agreements?

On the one hand, you have this whole set of industry certifications which have existed for a very long time. For example, collaboration with industries around creating food security, certification or microcredential that will cover different levels of the workforce. This is for semi-skilled, skilled and technicians, and people in more professional occupations. There is a tension in this labor market around trust across different spaces. What is trusted in the industry certifications in an industry context is not necessarily trusted in an educational or social partner context. These different forms of non-degree credentials tend to operate side by side—disconnected. Whether that will come together is unclear. In vocational education training systems,

generally even in those countries where we had a tri-party with social partners and industry involved, they do not respond fast enough to some of these emerging skills, and there are differences as to whether national qualifications frameworks permit the inclusion or referencing of other forms of non-degree credentials such as in Ireland. Whether this will happen across all the different vocational education training systems, we do not know, but there is a push towards opening qualifications frameworks to better prepare for lifelong learning.

MICHAEL: Universities are particularly challenged because universities have been in strong positions in terms of student attraction, and because there's so much at stake. The traditional systems that we have designed are not sufficiently flexible and responsive. In our experience trying to push universities to move into this space, there was a lot of resistance. Universities had to make many adjustments to be able to have credible offerings in microcredentials and alternative pathways, and to have customized curriculum design for adult learners and the workforce. Some of the work involved modularizing the design of curriculum, to break curriculum down into smaller pieces. But that in itself is not sufficient, because if you put a working adult in an undergraduate classroom, they're not going to have good learning outcomes. You are not tapping on their prior knowledge and the context they come from. So, what we are seeing from four-year degree institutions is having to rethink the delivery of curriculum and education to a completely brand-new segment of learners. The most successful institutions have had to set up distinct and separate operations, leveraging on the institutional strengths in terms of infrastructure, pulling some faculty in but having to engage a lot more industry practitioners in the delivery of these microcredential modular courses.

One of the trends we have seen as well is moving towards a competency-based curriculum design. This is not just about unbundling curriculum but getting clearer about the types of skills and competencies that are being delivered through the various learning opportunities. At Tec de Monterrey, about 8-10 years ago, we started moving towards a competency-based educational model across all our disciplines, not just in science and engineering, but also in social sciences and humanities. We are still in that transition process. We are doing research to understand better what works within the classroom and how to draw employers into that picture, with challenge-based educational opportunities for our students. Evaluating learning outcomes and looking at the curriculum design and drawing insights are part of that work.

In Singapore, the role of polytechnics in the higher education system was inherited from the British system. Their offerings are a lot closer to industry needs because the curriculum is designed with a lot of industry input. But even then, it is a challenge because the cycle of seeking industry input, working that into the curriculum, and delivering to students takes time. It is not sufficient for fast-evolving areas like cybersecurity.

We need to move beyond thinking about traditional educational institutions. Some of the latest skills and innovation are being pioneered by industry. As an example, the latest in analytics, coding, AI and machine learning (that knowledge) is being generated by the Googles, the Microsofts, etc. If they are not brought into the picture, we are only relying on universities and community colleges who will always be a step behind. How do we create the fabric to bring these private organizations into the picture and find a way to recognize what we call industry skills-based credentials? How do we create the fabric to recognize digital badges by different organizations and have that as part of the responsive system?

JACKIE: I'll start with a massive oversimplification. In Ontario, our university/college distinction sounds quite like the community and technical college distinction made earlier. Our colleges tend to offer shorter, career-oriented programs like

diplomas and certificates. Primarily universities offer baccalaureate, master's, and doctoral programs. Colleges have a lot of employer involvement. They tend to be very practical, and industry aligned. We also have nine Indigenous institutes in Ontario. These are Indigenous-governed and operated institutions that often work in partnership with our colleges and universities to deliver programming. Within our college category, we have private career colleges and polytechnics. So for simplicity, I'll group those categories into colleges.

Universities, colleges, and Indigenous institutes have received government assistance to develop microcredentials. All three have microcredential programs that students are eligible to receive financial assistance to attend. There is no framework to distinguish what the microcredential offerings look like between the three institution types, how they are similar, how they are different. We're really lacking that right now. In theory, our colleges are very well positioned to develop microcredentials for workforce development, because as Michael was saying, they already work with industry to develop their programming, although it is true it does slow things down quite a bit. Our universities tend to offer microcredentials through their continuing education departments. It allows them to be nimbler but creates complications around quality assurance because we don't have the same frameworks there.

So, in response to the question, are they being impacted in the same way? Yes, they are all eligible for funding and receiving it, they are all developing microcredentials now in Ontario, and students would benefit from quality frameworks applied to all three categories.

> What 2-3 predictions do you see coming internationally in the next few years around developments in microcredentialing?

MICHAEL: HolonIQ (worldwide impact intelligence platform that supports governments, institutions, firms and investors with data insights to power decisions) is doing **great research** around what the future might be. They surveyed 320 global institutions and 85 percent indicated that alternative and microcredentials are an important strategy for the future. They see them as a way to bridge higher education and workforce needs, and many view them as a complement rather than replacement to traditional degrees.

My prediction is that there will be a continued trend to offer more microcredentials, be they at the higher education sector or non-profit providers, due to rapidly evolving skills needs and the need for some form of trusted certification of skills (demanded by employers and workers). There will be continued proliferation of standards and approaches, and more startups. We are likely to see greater coordination and some consolidation among the players and actors, though I am not optimistic we will be able to pull everything together in a coherent manner. As colleagues shared, it is a messy space. Microcredentialing will remain relevant and important. Many tech companies are predicting the demise of the university and traditional credentials, but I do not think that will happen. Traditional institutions will find ways to incorporate microcredentials into their curriculum and leverage on the best that space can offer to students, both traditional and new segments. The whole enterprise of higher education, tertiary education, I think will remain intact, with some innovation, and macro-credentialing will remain the mainstay. Some governments will move to formalize this space.

JACKIE: I agree with everything Michael said. I suspect microcredentials will prove to be most useful as a complement to traditional education. They are most useful for upskilling rather than reskilling. They will work better because the learning is so segmented, so focused. They will work better to build upon foundational knowledge and

experience or introduce it or top up to help with skill articulation and credentialing, maybe co-curricular. I do not know that we'll see microcredentials, even if stacked together, replacing the kind of fulsome learning and entire skill-type education. I'm hearing a lot of anecdotes in Ontario about microcredentials being offered to undergraduate students, to assist with skill articulation and credential co-curricular activities. I suspect we will see a lot more of this in Canada. My hope is that will normalize the idea of pursuing short, focused programming as a complement to traditional postsecondary programs after graduation. Hopefully, by having these microcredentials inherent in traditional programming, we will see more students returning for lifelong learning after they graduate.

HANNE: I want to make a tiny detour back to the question about what is going on in different sectors. I agree with previous comments about microcredentialing being complementary. They are not at this point doing any substituting, they are not foundational — they are upskilling rather than reskilling. Probably the only substitution effect that will take place is in the absurdly overpriced professional master's degree markets that might skew a bit because people will be able to take short term microcredentials and other qualifications within five years.

There will be a continuing wider push by the global platforms for industry-based content. We see more and more content being delivered by industry. It is Google and others who are going to be increasingly taking on a role as providers disseminated through the global platforms. That is one of the trends we should expect. Also, analysts and policymakers will be pushing harder for us to generate information about labor market outcomes. We feel pressured on that front and about educational progression. We get many questions around the portability and stackability of these qualifications and need to be able to have some answers. The third answer we need is around the what-we-need-to-know question. And the learner profile: we get a lot of questions from governments around the equity dimension. Are these microcredentials working as an educational pathway? Are they genuinely stackable? Do they lead people somewhere? Are they leading to advantageous labor market outcomes? Are they equity-enhancing or simply providing an advantage to the advantaged? Those are the big questions we are getting from the governments with which we work.

Regarding predictions, I will not repeat what has been said. One of the areas I hear being pushed is whether microcredentials can finally be a solution to the recognition of prior learning, which even in those countries where legislation has been put on the table, does not work. It is too cumbersome and combined with developments in AI and automated assessments, this whole area of making learning visible through automatic testing is something we will see more of. In countries where we have strong social partner systems, there could even be a push to embed in collective agreements because more and more, the competence agenda is part of collective agreements, not just salary. Another issue is about higher education not working, being broken.

What 1-2 types of research are most needed to help understand microcredentialing?

HANNE: It is hugely important that we work together on understanding outcomes over time. That would be my key priority. We also need to work together on metrics. In Europe, we tend to close ourselves around our own approaches and solutions, and as a policy initiative microcredentials are so new so we do not have research networks on microcredentials. We are individuals who believe it is important to understand what is going on in a wider context of lifelong learning and labor market transformations. We need to come together at a global level because a learner perspective is in

principle, global — because so many of these non-degree credentials are offered in digital formats — so collaborating globally would help us understand microcredentialing better.

TOM: I agree with Hanne. We have to provide evidence around labor market outcomes and evidence around educational progression. We need to say something about the learner profile as well. I already shared the serious concerns about the deeply inequitable ways in which advantage gains greater advantage. What would be a priority for the governments with which we work is generating evidence about effective policy interventions to mitigate some of those inequalities. Right now, the OECD is promoting the adoption of individual learning accounts. I would love to see support for designing an experimental intervention around whether individual learning accounts would help mitigate some of those differences? There are lots of ways in which the inequalities emerge, having to do with underlying digital capabilities, asymmetries, and information, and other things maybe we cannot fix so easily. One of those would be around subsidizing people to take on these qualifications that find it difficult to provide childcare, have digital connectivity, and other problems that governments can mitigate effectively.

JACKIE: I completely agree. In addition to data about outcomes, it would be great to have data about student characteristics or demographics; and data about the formats and content of programs so we can understand what is working best, for whom, to develop knowledge and skills. We need a better understanding of the contexts and mechanisms for teaching specific skills to specific students, and who is benefiting from those. For example, are there some skills that are better taught in person (rather than online), or vice-versa, for certain demographics of students?

MICHAEL: We need more comparative studies about what practices are working within nation states, within institutions, within islands. We need better clarity. Even though contexts differ, we can draw out nuggets of wisdom to try to apply in the different contexts. If we can do that well, we generate enough momentum so that those islands hopefully become continents. I don't think we will have one world anytime in the near future, but we could at least expand the effectiveness of implementation across us by sharing information. As example, Tecnologico de Monterrey is seeking to work with 14 institutions across Latin America to distill best practices in lifelong learning and implementation within these universities. We intend to share that information with other institutions as a way of trying to build those islands and continents.

5

INTERNATIONAL DEVELOPMENTS IN MICROCREDENTIALING

NCRN MEMBER: I agree that microcredentials, whatever that means because in the US we use the word loosely, are important and growing. A significant driver in the US, somewhat unique in the world, is the power of the professional societies. Some 50 percent of the credentials in the US come from outside the postsecondary system. They would say they've been doing microcredentials for years because they have certificates. They have PhD-prepared people, so they control the standards of practice. The practitioners from industry have something to say about what's going to go forward. The programmatic accreditors come out of the professional societies. They determine what the universities teach to go into that occupation or that profession and the certifications which are spin-offs of the professional societies. There are over 8,000. They are the ones that come up with validated competencies, skills, non-skills, and abilities and are testing competencies. The integration of these types of credentials will make us stronger, by cooperating with each other.

NCRN MEMBER: We often talk about credentialing systems, etc. as being homogeneous and a good idea everywhere. But contextual and institutional circumstances can make a thing successful a failure elsewhere. Tom Weko mentioned regulation in Hungary. What things do you believe make a credentialing system in the future of credentialing systems successful as you look across countries? What are the elements you would say would be the lowest common denominator of success as we move forward to implement these systems?

TOM: First, you need something on the labor market side. You need enterprises willing and able to reward the people's effort in acquiring and validating their additional skills. That's clearly something that has to be present going back to the example of something like Japan on the supply side. You need providers too – those can be entrepreneurial and capable universities, entrepreneurial and autonomous and flexible higher education institutions able to generate the supply side. You also need them to be able and willing to work with professional bodies. That's one of the success stories of the US perhaps. What is probably under appreciated is the enormous role the professional bodies play in developing, testing, and validating those. Those can run either side by side or be assimilated into the educational institution. Then you need a policy if they're going to be trusted, and fulfill the promise that people put in them and the public investment in them. You need some framework around that, a policy framework that creates a meaningful signal. I'm thinking about the work that's come out of Northeastern University around how employers recognize and anticipate what skills are associated with the credential. Is it readable, meaningful, and trusted? You can have islands of trust in the US because the professional societies and recognized firms, whether Google or project management professionals. You have islands of trust, but you don't have the wider public architecture of trust, and maybe you'll never have that in the US because of the mess of federalism, free market, and volunteerism. Maybe the US will end up with lots of islands and be Ireland or New Zealand. That's just the way it is given our different structures.

NCRN MEMBER: A downside of all that proprietary rule making is also that it excludes people and creates monopolies or oligopolies over labor markets. One of my worries around Google

and Amazon in this space is exactly that they can control what skills are valued. There are many issues with that. My point is to touch on something Hanne was getting into. I hear a lot of conversations about microcredentials, but if I were to talk about the future, I would want to frame this more around platforms. It is not simply putting a class online, but like a "Netflix of learning" that is also gathering real time, big data that is adding a whole other dimension of AI matching --understanding demand based on user behavior on the site. I feel like there is a level of the shift happening that if you see some of the platforms getting built in companies in US, for example, that is part of the future. From a governance standpoint, it raises a whole other set of questions that I have not heard today, which have to do with who owns your data and what are the ethics around AI bias and how they predict what learning options are given to people? What job options are given to people on LinkedIn or other platforms? The trend is people are using platforms to not only find jobs, but also get learning recommendations and find out what it is that employers want. So, there is all these other governance questions that come into play. Quality and those types of issues are really important, but I'm also concerned about other things like digital equity, digital literacy, and who even has the ability to get on these platforms to begin with.

NCRN MEMBER: One of the messages of the panel was microcredentials being more about upskilling which, raises a question if these types of credentials will be primarily used by people who already have had access to education, as we think about how to incorporate this idea of inclusiveness. Part of the argument behind microcredentials has been that they are not as costly, and they are easier for working adults to get. If they are not opening opportunities with people who traditionally haven't had access to opportunity or education, how do we incorporate that consideration as we think about the role of these credentials? Is the microcredential movement more about upskilling and for people that already have degrees or other credentials, or is it both?

MICHAEL: Those are important points as we think about lifelong learning. We need to think about access and inclusion. It may not be immediately obvious as we think about workforce needs — bridging skills gaps, and so on. If we are going to move towards thinking about lifelong learning in terms of universal access and as a public good, then we need to build the additional infrastructure for other segments of the population. I would draw on a few examples of what we have done as part of the SkillsFuture movement in Singapore. There is a segment of the workforce that is not digitally literate, that has low literacy and low numeracy, perhaps doing very menial jobs. But they too need to pick up digital fluency skills. They need to start to learn how to use electronic payments, interact with government processes through smartphone apps, and so on. We have designed special programs specifically for those segments of learners. And we fund those separately so the economics of that is completely different (from regular workforce training support). It's not targeted towards employment per se. It is targeted towards more of day-to-day living for that segment, and the government puts a lot of money behind that. These inclusion programs are well-received, especially during the COVID pandemic, when a lot upskilling could not be done face to face. We had to run special workshops for those who were not comfortable with online learning, to handhold them through a day of logging onto Zoom and so on, and we have seen some really good results. After about a day of immersion, they built the confidence and ability to log onto online learning and were able to continue learning on an ongoing basis. This inclusion agenda is very important, and we might have to look at it somewhat separately from the workforce skills development systems we're talking about. Although we are using the term "microcredentialing" very loosely, when I think about microcredentialing, I am thinking about lifelong learning opportunities for all segments of learners and recognizing such learning whether for employment purposes or for day-to-day living.

JACKIE: When I think about microcredentials as a complement to traditional education, there is still a huge equity component to that. We can think about microcredentials as bridging programs to introduce students to a traditional pathway. We can also think about them as opportunities to top up learning over the course of a lifetime. We know from existing research that in times of displacement, individuals who return to school for even a short time, are likely to see increased earnings (compared to displaced workers who do not pursue more education) when they return to work. They are also expected to get better benefits and obtain full-time work as opposed to part-time work. The problem, at least in Canada, is that the return to school is not easy. In Ontario, the main program in place to support displaced workers in returning to work (Secondary Career) is outdated in that it prioritizes applicants with minimal or no previous postsecondary experience. Meanwhile, research shows employers are more likely to spend training dollars on their most highly educated staff. This leaves a gap in available retraining options for middle-skilled workers Knowing that traditional undergraduate programs are becoming outdated quickly, governments should support equity by thinking about how to make short, focused learning opportunities accessible to those with previous postsecondary experience so they can avoid displacement or adapt in the face of it.

I worry about equity in the context of stacking microcredentials together to create pathways for equity-seeking students. Specifically, I worry that in modularization, in that stacking together, we are providing access to a less high-quality learning experiences — experiences that may be missing important general education components or transferable skills, or that may be assessed differently by employers. We need to think about equity of access as well as equity of outcomes, and in the absence of data about microcredential outcomes, I worry that a stacked pathway may not be on par with traditional programs. We should monitor outcomes to know for sure and adjust policies and practices accordingly. Meanwhile, early research suggests that offering microcredentials as complements to traditional programs — at the beginning, during, or after a traditional postsecondary experience — could do a lot to improve equity.

HOLLY: Several consistent themes emerged from the discussion of microcredentialing drivers and trends:

- The first credential is often insufficient in the workforce; lifelong learning needs will drive growth in microcredentialing.
- The COVID pandemic is a driver in the need for skills training and upskilling.
- There is growing recognition that skills and competencies are important and microcredentials will be important in employer hiring to capture these.
- There will be more microcredentialing: modularizing of curricula, unbundling of academic programs, and microcredentials embedded within traditional academic programs. Microcredentials will be a complement to traditional higher education not a replacement; there will still be need for traditional higher education programs (macro-credentialing).
- There will be more attention to the recognition of prior knowledge.
- Microcredentials could be a strategy for increasing diversity and inclusion in education and workforce — but more data and analysis is needed to understand how best to employ them for this purpose.
- Industry will drive many of these developments and many large companies will offer their own microcredentials.

- Formal and nonformal learning offered by not just higher education will continue and expand, moving beyond traditional institutions.
- Developments will remain variable across nations given diverse regulatory structures and supply and demand needs: some countries will suffocate innovation while others will push hard on innovation efforts to prepare a better workforce through microcredentialing.
- Reforms in qualifications frameworks will drive the addition and acceptance of microcredentials in many nations.
- There will be a drive toward common standard in microcredentialing.
- More global networks will share developments to learn from one another.
- Nations with centralized governmental structures will lead many developments through policy, financial incentives, and regulations.

6 LABOR MARKET OUTCOMES OF NON-DEGREE CREDENTIALS

Four seasoned researchers joined the 2022 Non-degree Credentials Research Network (NCRN) Conference, *Non-degree Credentials on the Move*, on April 28th to discuss the labor market impacts of non-degree credentials. Moderated by Jeff Strohl (Georgetown University Center on Education and the Workforce), the panel included David Richards, Associate Research Analyst at the U.S. Department of Education – National Center for Education Statistics; Matthew Baird, Economist and Co-Director of the Center for Causal Inference at RAND Corporation; Daniel Kuehn, Principal Research Associate at the Urban Institute; and Ashley Edwards, Director of Data Services at Opportunity@Work. **Session slides are available here.**

DAVID RICHARDS: I'm a study director at the National Center for Education Statistics, where I'm primarily responsible for the Beginning Postsecondary Students (BPS) Longitudinal Study. You've already heard IPEDS discussed; BPS and its two related studies, National Postsecondary Student Aid Study (NPSAS) and Baccalaureate and Beyond (B&B) are complementary to IPEDS because they use IPEDS as a sampling frame. Then we go in and get a representative sample of institutions, then we get a representative sample of students. From these, we get cross-sectional snapshots of the U.S. postsecondary population every four years for the NPSAS. For alternating base years, we spin off the B&B study where we take newly minted baccalaureate degree recipients and follow them for 10 years see what kind of outcomes they have in the labor market; i.e., post-college, in the workforce, graduate school, or whatever they decide to do. We also use the NPSAS here. The base years for the BPS longitudinal study, where we take first time postsecondary students who, in the year that NPSAS us studying, have not taken any post-secondary classes since completing high school. We follow them for six years.

That brings me to the present discussion, the most recent completed cohort of BPS. In the first follow up study, based on three years of data,

we published a SIB ["Stats in Brief"] — **"Sub-baccalaureate Students, an Overview of their Institutions, Programs, Completions and Labor Market Outcomes After Three Years."** We took three years of BPS data and looked at students who started in sub-baccalaureate programs, associate degree seekers, and certificate seekers, and looked at those who were not enrolled three years later and were in the workforce to look at labor market outcomes and earnings. We found that three years after enrolling, 52 percent of 2011-2012 certificate students had earned a credential and an additional 11 percent remain enrolled, whereas 18 percent of associates degree students received a credential and an additional 40 percent remain enrolled. Amongst students no longer enrolled after three years, there was no significant difference in the median annual salary, or between certificate completers and certificate non-completers — together they were making about $20,000 for each group. However, employed associates degree completers had a higher median annual salary than associates degree non-completers, respectively, $22,000 versus $19,000. We also have breakdowns by sex and field of study.

A natural question at this point is ask is what are these outcomes looking like six years later? We are currently in the process of figuring that out. We have completed the final follow up for this cohort of BPS and just released those outcomes tables. You can access them using the links below:

- **Table 220407**: ENROLLMENT INTENSITY, Among 2011–12 first-time sub-baccalaureate students, percentage distribution of enrollment intensity through 2017, by initial program level: 2017
- **Table 220408**: COMPLETION BY ENROLLMENT INTENSITY, Among 2011–12 first-time sub-baccalaureate students, percentage distribution of 6-year completion and enrollment status, by initial program level and enrollment intensity through 2017: 2017
- **Table 220409**: COMPLETION STATUS, Among 2011–12 first-time sub-baccalaureate students, percentage distribution of 6-year completion and enrollment status, by initial program level and first institution control and level: 2017
- **Table 220410**: COMPLETION BY FIELD OF STUDY, Among 2011–12 first-time sub-baccalaureate students, percentage distribution of 6-year completion and enrollment status, by initial program level and initial field of study: 2017
- **Table 220411**: EARNINGS BY COMPLETION STATUS, SEX, AND FIELD OF STUDY, Among 2011–12 sub-baccalaureate students as of 2017, median annual earnings among those employed in 2017, by initial program level, completion status, sex, and initial field of study: 2017

Next, I'd like to give you an idea of what kinds of data you can find on the topics discussed today. Using NCES data, we recently relaunched a revamped "**Data Lab**" tool, which should be a lot more user friendly than it used to be. And when the new IEPDS data comes out, you can also view it there. If you want to apply for restricted use license you can get restricted use data file of BPS data, NPSAS, or B&B data, and you can merge it together with IPEDS data. You can do a lot more analysis when you merge institutional and individual survey data.

We have earnings data in BPS and hope to have some findings around six-year earnings data

available online soon. We've also used the six-year data to publish findings on a variety of other topics, such as financial aid, including total aid to students who began baccalaureate programs, and these findings will be made available in web tables. In the 2017 follow-up, we look at 2011-2012 first time postsecondary students six years later. If you pull up the NCES website, you'll find it under publication number 2020-236. This covers a lot of different topics — there's a series of four web tables that provide summary statistics for all kinds of students, at all enrollment intensities, showing outcomes in terms of attainment and persistence on a variety of different topic areas.

Looking by degree program, we found that after six years, 84.5 percent of certificate-seeking students received grants and those grants averaged $4,007 in total value; and 59.9 percent of certificate-seeking students received loans. Students have received loans in amounts averaging $7,200, and for associate degree-seeking students, 67.1 percent received grants at amounts averaging $4,000 and 28.5 percent received loans and amounts averaging $5,400.

We have additional tables showing breakdowns by source of grants and enrollment intensity, for example. We have a lot of data and hope you will be able to use it.

NCRN MEMBER: David, could you talk about the ability to use BPS to look at trends in these various data, because I know the BPS has multiple findings?

DAVID: Yes, there are limitations. You have to be somewhat deliberate in how you do that. We do have an online data tool which gives the ability to perform trend analyses using multiple data collections over time. One of the nice things about that tool is that it's constructed to take into consideration differences in these data collections and how they vary from each other. For example, we have not always included data for Puerto Rico. So, if you want to do these trends analyses on your own, you must consider the fact that Puerto Rico was not always included in the sample. The online data lab tool does it automatically for you.

MATTHEW BAIRD: I'm going to talk about some research that my colleagues and I did—Robert Bozick at Rice University and Melanie Zaber who works with me at RAND — on trying to estimate the labor market returns or the benefits to having a credential, trying to get at more causal estimates through different statistical methods. I'm not going to spend too long trying to define these things for this audience so I can save time to talk more about the findings. The main point we're trying to show is that by using the Current Population Survey we can estimate labor market returns separately for licenses and certifications.

We think about the economic value of credentials in three ways. The first, is that credentials are reflective of increased productivity (human capital) — that people learn things and that makes them more productive workers, and firms are more willing to want to pay them more or be more willing to employ them, based on their increased productivity. The second is a signaling effect. In the economics of education literature, this is called a sheepskin effect —where the idea is that employers are seeing this credential as a signal of your quality, not just of the increased productivity from this, but that it's correlated with other attributes about you, and that because of your persistence you're more likely to be a go getter and go on to be a high achiever. The third is potentially occupational closure. This is for licenses where it may constitute a right to work; seen in the reverse, you have the inability to work if you don't have a license which decreases labor supply, which puts upward pressure on wages as firms have to compete for fewer workers. There's going to be variation in this due to the huge landscape you've heard about today— huge variation in the types of credentials out there.

Our goal is not to look at any specific credential, we're looking across all of them using the CPS. Part

of the literature has shown that there have been positive returns to licensure and credentials. They focused on the earnings margin, how much does your pay increase from having a lesser credential?

You're seeing in these published estimates that the earnings premium can sometimes be quite large—18 percent is quite a large earnings increase. The estimate is a little bit smaller as we're getting to a more recent literature using more nuanced methods and trying to better control for some selection issues.

Prior studies have had limitations. Most tended to rely on ordinary least squares where we're just trying to run a regression of what are your earnings, based on a credential and other covariance. This is going to not solve our main concerns, which are going to be around selection and different forms of heterogeneity. We're going to look at returns by gender as well, so we stratify everything by educational attainment. There's an important distinction between those with sub-baccalaureate and baccalaureate credentials, but we also explore it by gender later, so why would the prior estimates potentially be biased, or why less biased? This is going to be primarily when you think about things like omitted variable bias, selection bias — someone that is more likely to pursue and attain a credential might, on average, be a more productive person and higher achiever, so we might not be recovering an estimate of the return-to-the-credential but to the return-to-this-type of person. We want to control for that. There's also certainly measurement error and these estimates come from self-reported data. We know that the literature has dug into this and shown that the CPS data on income and earnings have measurement error.

The returns-to-education literature we're trying to build on typically use what are called instrumental variables to solve these bias problems. However, the typical instrumental variables that the literature has used for returns-to-education are not applicable to studying the returns-to-credentials. They're not useful. To run through some of them, you have distance to nearest colleges – but you can get credentials and all sorts of ways, including remotely, i.e., online. Change in tuition costs financial aid — we don't have that kind of information and even if we did it would be hard to validate and understand well. You also have changes to mandatory schooling, etc. what we need do is build new instrumental variables. What we're using is the local peer credential rate, or what we're looking at within the metro area of the respondent in the CPS, we're looking at people that are there, their peers according to their gender, race, ethnicity, educational attainment, and age — and then see the credential rate of their peers. The idea is to say, "well, conditional on other covariance, a person that has peers that are higher credentialed is more likely to be credentialed." We're going to try and argue that there is an informational story, a peer network story, that when you have more peers that are licensed you, that has strong predictive power. Either in the first stage regressions where what we're finding is that if you have peers that are highly credentialed, you are more likely to be credentialed, whether that's for licenses or for certifications, and that's even true once we throw in a whole host of control variables which, as expected, weaken the power in that first stage but don't make it disappear.

Whenever you do instrumental variables, you might be worried it might not work because of the exclusion restriction. We have a lot of evidence and sort of narrative support to why we think this instrument would work well. The main point we're going to pursue is controlling for the peers' earnings and the peers' employment rate, and additional controls in our model so there's going to be a conditional exclusion restriction assumption.

One of the key contributions of our paper is not only looking at returns to earnings, which is what the literature is really focused on, but also the returns to employment conditional on being in the labor force. This is going to be a huge and very important dimension on which credentials serve a purpose and contribute to success. We're going to use what's called the marginal treatment effects estimator.

This is a newish methodology which you can use when you have continuous instrumental variables and allows you to recover what's called the average treatment effect which is across the whole sample asking, what is the return?

The earnings effect —we typically mean conditional on working,— is saying, part of the earnings return is just the fact that you're able to get a job. So, what portion of the return is due to that versus increased earnings conditional on working?

The CPS tables leave a bit to be desired, but this is a limitation we're working with in the nature of the questions, as was discussed earlier. The questions are asked in such a way that we can identify responses between "do you have a license or credential, and if yes, one, not the other." It's like a Venn diagram – you have a licensed circle, and one for having certification, but we can't see the area of overlap from the way the questions are phrased. We can tell if one has a certification alone, but we don't know whether one has a license in addition to a certification or a certification alone.

So, for licenses, I'm going to focus on the average treatment effects — the overall estimate, the impact, for the sub-baccalaureate that is about a 15 percentage point increase in the probability of employment. That is much smaller for a bachelor's degree, but still reasonably large at around four percentage points. For certification it's even larger, and very large for the sub-baccalaureate population — 37 percentage points, whereas for a bachelor's degree, it's near zero. Sub-baccalaureate for either kind serves as an important signal or increases their employment quite a bit. On lost wages, the interpretation of these coefficients is roughly "percent increase in earnings conditional on working." Here there's an important distinction. Do we control for occupation and industry fixed effects or not, so when you control for occupational and industry fixed effects, how much does your earnings increase within the same occupation or industry? What about the fact that the license allows you to change occupations and industries, potentially?

So, let me include the fixed effects. What do we find? First, we find that whenever we control for the fixed effects, the occupation (the industry) estimates get closer to zero, whether it was negative before it gets closer to zero or positive as t gets closer to zero. We also find that for sub-baccalaureates, you find a large positive return to licenses, 26 percent. For certification it's not statistically significant but it's in the same range. It's a pretty large increase in earnings, whereas once we control for the fixed effects, it drops to about seven percent. The interpretation is that the primary wage benefit from credentials for the sub-baccalaureate population is allowing them to move into higher paying jobs. When we look at the bachelor's or higher, we find a negative estimate for the license. Here, once we control for the fixed effects, it flips— it becomes positive and is reasonably large though not statistically significant. What's going on here? We think, this is due primarily to the fact that for the bachelor's degree population, most of the many licensed occupations are low paying (think about nursing, social work) whereas many high paying occupations are not licensed (CEOs, management, engineering). If you want to think about the more causal lessons: when we include the occupation and industry controls, whereas the other is less causal and more about the sorting story—-where the credential allows you to enter.

A final point on gender: we find substantial differences when we stratify by gender. The largest returns for women are for employment effects, that a credential] really acts as a device that allows them to get hired. This can be tied to the literature on discrimination by gender and why this serves as an important tool to combat discrimination.

DANIEL KUEHN: My research primarily focuses on registered apprenticeship. I want to give you the landscape of what we know about apprenticeship and talk about some of the older impact research that's been done, what we're currently learning, and some of the federal research efforts on apprenticeship. Then I'll say a bit about what I think

we need to learn, and where the apprenticeship research needs to go next.

I think everybody's familiar with apprenticeship, but I want to make sure everybody knows all the components of an apprenticeship program. First, it's a paid work experience. We all know that apprenticeship is work-based learning, but it must be paid so we're not talking about job shadowing, unpaid internships, or anything like that. Second, it's on the job training that's provided by a mentor or supervisor on the job, whether it's registered or unregistered. There needs to be this mentoring relationship, providing a lot of the education and training through demonstrations of skills on the job. The third element is called related technical instruction; this is classroom-based learning (theoretical learning) that complements the on-the-job learning. It's typically shorter than a degree typically many fewer hours spent and sometimes it's provided by the employer themselves, sometimes at colleges, and this is where the college credentials come in. Apprenticeship programs must provide the industry recognized credentials; sometimes, these are degrees, but rarely do apprenticeship programs provide degrees. So, these are primarily non- degree credentials. And, finally, apprenticeship programs have policies for safety, supervision, and equal employment opportunity.

I think we're mostly familiar with registered apprenticeship, these are registered with either the US Department of Labor or, in some states, a state apprenticeship agency. But there is also unregistered apprenticeship, and this is bigger than the Industry Recognized Apprenticeship Programs (IRAP) initiative under the Trump administration. All kinds of programs exist that do this work but are not registered.

Apprenticeship has been growing recently— the number of active registered apprentices from the Office of Apprenticeship. It's been growing steadily from under 500,000 active apprentices in 2015 to over 600,000 in recent years. This is, after a dip, after the great recession and it's been consistent even during COVID. New apprenticeship registrations have slowed down, but the total number continues to increase. So as far as the magnitude of registered apprentices, there are a lot of people training under this training model in the country. It's harder to estimate the number of unregistered apprentices, but the most recent estimate suggests that about as many unregistered apprentices could be in a program that we consider an apprenticeship program.

I want to say a little bit about outcomes for apprentices. For these programs, it's a minimum of one-year, 2,000 hours of on-the-job training, but they can be five or six years in duration. Every program is a little different, so you must take the data back in time to look at outcomes. I took it back to about 2016 to follow all the apprentices through the end of their program. 48 percent of apprentices who registered in 2018 or 2016 canceled, 40 percent completed, and there is 11 percent in the RAPIDS [Registered Apprenticeship Partners Information Database System] data who say they're still registered. I think that's unlikely given the time lag. Its possible employers might not have updated the RAPIDS account, but it's possible that they're still registered in some of these long programs, even in the first quarter of 2022.

Wages vary depending on occupations. The average starting wage for registered apprentices is $16.29 per hour and exit wage is $23.67. This is the exit wage, but it could be the completion wage if they complete or whatever wage they're being paid at exit, but this varies. The 25th percentile for apprentices registered in 2016 was $15, 75th percentile was $30, so what you're earning depends a lot on the occupation you're training for. The RAPIDS dataset doesn't have wages after completion the way the Workforce Innovation and Opportunity Act Participant Individual Record Layout (PIRL) does. We only know the exit wage and that's a big constraint on research. Just as there's variation in wages and we care about the different kinds of occupations that people are training for, we care about who's picking up these apprenticeship opportunities. Historically, there's been a lot of discrimination against women and people of color in registered apprenticeship.

On women, the share of apprenticeship is still very low— in the teens, much lower than their prevalence in the population. It's been growing a lot recently— it's been in the single digits before 2015. Black Americans' share of new apprentices has s been steady at around 12 percent which is near their share of the population, but recently it's been falling and it's hard to say why — maybe it's related to certain occupations. Looking at the apprentices who registered in 2016, Hispanic apprentices are the highest paid apprentices, on average, a $25.28 exit wage for Hispanic men, $21.12 for women; Black apprentices have the lowest exit wages, $18.59 for men and $16.47 for women. Looking across all of these, it's important to keep in mind that apprenticeship training is across different occupational fields and occupational segregation is driving a lot of this. A lot of women have been entering healthcare apprenticeship programs, including Certified Nursing Assistant programs. These are low-paying health care programs so that's a lot of why they have lower exit wages for the racial differences. Two thirds of apprentices are in construction. But the Black share of construction laborers (a lower-paying position within construction) is twice as high as the white share. For electricians, a relatively well-paying construction apprenticeship position, the share of Black apprentices that are electricians is two-thirds the share of white apprentices that are electrician. So, if you drill down the occupational segregation stories are important to these outcomes for both women and racial and ethnic minorities. So, earnings matter. I also wanted to say a little bit about the impact research that has been done.

This isn't my research, but there are two broad-based, well done impact studies in apprenticeship. One is by Deborah Reed and her colleagues at Mathematica. This was a study of program earnings for registered apprentices across 10 different states. They found a $6,595 increase in annual earnings for apprentices, six years after starting an apprenticeship program. It's important to note that these aren't necessarily completers, this study looked at anyone who entered a program. They matched with a comparison group with similar accepted apprentices who didn't start their apprenticeship program and found that when you project lifetime earnings, there's a much larger gap, $240,000.

The other major study cited a lot is by Kevin Hollenbeck at Upjohn Institute. He looked at Washington State but it's all the apprentices in the state so it's a broad-based study. He found a $3,715 increase in earnings per quarter for apprentices three quarters after their exit. There are characteristics of these two studies that probably affect the results, such as different comparison groups. However, I think of these studies as good markers of what the range of labor market outcomes is like.

What is coming up soon? The first, and these are both funded by the US Department of Labor, is an evaluation of the American Apprenticeship Initiative (AAI) grant program which started in 2015 and supported 45 AAI grants. These grantees operated as intermediaries. They set up and supported a lot of individual apprenticeship programs. This study includes an implementation study and outcome study, but it doesn't include an impact study.

After that, we'll see several studies that I think are going to be interesting, starting with an employer return on investment study. Since employers are essential to starting an apprenticeship program, just understanding their costs and benefits from apprenticeship is so important. And an employer outreach demonstration study, so that's a RCT but it's not on the impact of apprenticeship on earnings. On these, this research is coming out. Some of these reports are out already; the outcome study isn't out yet and that's what the Urban Institute, ABT Associates, and our partners will be working on.

We've more recently started the apprenticeship expansion portfolio with the Urban Institute, Mathematica, and Capital Research Corporation. And this also includes an implementation study of six different DOL apprenticeship investments, two of them we mentioned earlier that the best apprenticeship pilot, and women and non-traditional occupations, and then for other apprenticeship grant programs. And, so, these implementations have helped us understand what's going on underneath the hood of a program, how they're designed, and some of the obstacles they face. And this will also include an impact study, and it will be innovative in a couple different ways: first it's going to look at registered and unregistered apprenticeships.

The two grant programs we're looking at can support unregistered apprenticeship even though it's a Department of Labor grant program and then we're also got new, growing fields like advanced manufacturing, IT, and healthcare. These are new, growing markets for apprenticeship, and so we'll have estimates specific to those fields. The impact studies that I had mentioned before are dominated by results for construction apprentices. Two thirds of apprentices are in the construction sector, so think of these as predominantly construction results. Soon, we'll have results from some of these newer, emerging occupations.

Just to wrap up, I want to give kind of a big picture soapbox, an overview of the different phases I've seen, how I think about phases of apprenticeship research and then, and then on the far end, where I think we need to go. So, first, there was what I think of as the first generation of apprenticeship research that produced impact studies. The Department of Labor was funding work that looked across the apprenticeship system, it might have been in specific states, but it was across all the apprenticeship system and wasn't tied to specific grant programs or specific DOL investments. That approach had costs and benefits. One of the costs that I just mentioned is that the research results really reflected outcomes in the building trades [even if not by design], but that's not where the expansion of apprenticeship is now. It's less focused on the non-traditional occupations that we're seeing now.

We're doing a lot more implementation studies than we did previously. One, it's more focused on these new models, with more focus on these program design issues that programs run into. And then, of course it's more focused on the health care and IT apprenticeships that are emerging. But we haven't really had any impact studies. The one that I

mentioned that we're working on now will probably be out in 2025. And it's also not focused on the broader apprenticeship system so we're looking just at these grantees who have applied for competitive grants. I think where apprenticeship research needs to go in the future is to kind of blend the best of both prior generations of research. It's important that we have system wide impact studies that look at programs that aren't supported by DOL, that are out there on their own working on their own. But, then it's also possible to drill down to these new models and non-traditional occupations so something like the Reed study across 10 states but looking at its apprenticeships and not restricting it to do all grant supported it apprenticeships, I think that's the evidence we need. And then finally just continuing this good implementation work that's been done to really understand new models, how to set up programs because these programs look very different depending on the occupation, depending on the certification that comes out at the end of it. Understanding the consequences of program design choices is going to be critical.

ASHLEY EDWARDS: I'll be discussing the role of credentialing on mobility pathways for workers that we call Skilled Through Alternative Routes (STARs). We'll talk first about the challenges that these workers are facing in the labor market, the role that degree requirements and credentials are playing in their mobility, and how we can better understand these different skill signals and how they might allow us to identify and unlock employment pathways for these workers.

When we talk about workers as being STARs, we're identifying them by what they have, which is skills. They acquire those skills through alternative routes. STARs make up most of the labor force —70 million workers who have a high school diploma but, as opposed to a bachelor's degree they've gained their experience through community colleges, military service, apprenticeships, boot camps, and most commonly through on-the-job experiences. The concern we have is that stars haven't been able to translate those experiences and skills into earnings. For example, consider the chart showing lifetime earnings growth for STARs going back to 1989. In 1989, STARs who were just starting their careers were making 27 percent less than a recent college graduate. Over the course of their entire 30-year career, these STARs were never managing to reach t college graduates' starting wage. In other words, our labor market is equating four years of learning and college with three decades of lived work experience. So, how do workers experience mobility and what role do we think degrees and credentials might be playing?

Workers experience mobility by applying their skills to make upwardly mobile job transitions. Here we're illustrating the high skills overlap across a job transition that would offer significant wage change, in this example, from a retail salesperson to a sales representative. The skills that retail sales workers are demonstrating on the job are highly valuable and directly transferable to a lot of high paying work. We have 35 skill measures that are captured in the O*Net database. We're able to assign a summary

skills distance score across two jobs. The lower the skill distance, the more similar two jobs are. It's important to know that this isn't just a thought exercise thinking about skills. We're also using the CPS Annual Social and Economic Supplement to observe how workers make job changes year over year. What we find is that skill distance and occupational flow rates are strongly correlated.

In this example, we see around 10,000 STARs making this exact job transition (salesperson to sales representative) every year. We also find that when workers make job transitions, they also get larger wage gains when they move into jobs with higher skill demands. What's really striking is that workers with a bachelor's degree are much more likely to experience larger wage gains when moving into similarly higher skilled positions. STARs are really getting significantly less value out of their skills. We propose that the value employers are placing on bachelor's degrees is what's driving this opportunity gap we've seen for STARs. This is data from the Bureau of Labor Statistics. Credentialing and licensing are often seen as more accessible alternatives to formal degree requirements. But it's important to recognize where we're at right now — most STARs do not currently report holding a credential. Around 2 percent of STARs have a certification, and around 20 percent of STARs have a license. To provide some context, most STARs have taken some college classes and 22 percent have an associate degree. STARs with a credential earn about 15 percent more but this is measuring the returns. For most STARs who have relevant skills to move into higher wage work but that don't have a credential or license, it's difficult for workers to assess which credentials are worth investing in. This is not just a challenge for STARs.

Given the huge proliferation and number and types of credentialing programs, the employers that Opportunity@Work speaks with are overwhelmingly struggling to distinguish value across these credentials. Prior research has been helpful in this regard. It does indicate that employers have preferences for certifications. Certifications are generally awarded by industry and trade groups and include an examination process. Certificates, on the other hand, are generally less valued by employers. They tend to reflect short term courses and are granted by education or training providers. Going back to certifications, there are over 4,000 review bodies (certification issuers and less than 10 percent of those bodies are accredited by an external party. Recent reports by Burning Glass found that only 15 certifications made up 66 percent of all certifications in job postings, the most valuable being a CPA, PMP, and a Cisco network certification. Again, the research reflects the vast diversity of certifications. For a CPA certification, you must already have a college degree, it typically takes seven years, and the cost is around $5,000. Alternatively, you have the Cisco networking certification, a single assessment, that you can study independently online. The process usually takes around three months and costs $300. So, we're talking about a huge range of credentials.

How do we think STARs could be achieving mobility, with an eye to these degree requirements and credentials? Opportunity@Work has done a lot of research looking at how workers make job transitions using data on occupational skills, worker supply, and employer demand. We use that information to identify mobility pipelines for STARs, obviously explicitly focused on the role of degree requirements. But we can also take advantage of additional resources that will shine some light on the extent to which credentials and licenses might be required for occupations along certain pipelines. I've been surprised not to hear much today about the Occupational Requirements Survey (ORS). It's a survey of businesses and governments conducted by the Bureau of Labor Statistics, and it provides the typical job requirements needed for any occupation. It's a comprehensive data set on occupational requirements, and valuable for understanding certifications, educational certificates, and licenses. The challenge is that it doesn't provide the specific types of certifications or licenses needed for one job

versus the other. We can't pull it into the way we're modeling mobility to get a better sense of where credentials are needed across that pipeline, and where might they be complementing or supplanting a bachelor's degree requirement.

As workers move from assemblers to inspectors to first line production supervisors, we think degrees are less likely to be a constraining factor. Only 15 percent of front-line supervisors, what we would consider a higher wage destination job, currently have bachelor's degrees, so this is likely a pathway where credentials will be more important. We know that 22 percent of inspectors will be expected to have some sort of license or certification, while only 16 percent of current workers in that occupation have a bachelor's degree. In contrast, 100 percent of truck drivers will need to have a credential (e.g., a commercial driver's license) while only 8 percent of drivers have a degree. It's useful to think about where credentials are being required and how those requirements align with degree expectations. The next question then is understanding the specific credentials that will be required, their cost, time to complete. That information will allow us to better evaluate what type of potential this pathway might hold for STARs. We can use job postings data to get at part of this question. We have talked a bit about the data on employer demand and job postings.

Here we get interesting results across all the occupations. By far the top requested credential is a driver's license. It's likely that the license is serving as a proxy to confirm legal U.S. work status. But it's also interesting that it does list some valued credentials and certifications, but only 13 percent of employers are explicitly asking for those —as example, technician and welding certifications —in their job postings. Then, even in our higher wage destination job, only six percent of employers are asking for management credentials, although it is useful to know that Six Sigma tends to be the preferred sort of operating procedure there.

The other key thing we would note, especially as an organization focused on skills-based hiring and removing degree requirements, is that even though we saw previously that only 15 percent of current production supervisors have a bachelor's degree, 37 percent of employers are listing such a degree as the minimum educational requirement in their

job postings. So even if you had the ideal mix of credentials, you still would struggle to get past that screener given that they're looking for that using the bachelor's degree as a stronger skill signal.

To wrap up, I'm seeing that over 60 percent of workers in the US don't have a bachelor's degree. We think it's critical that employers are able to recognize the value of STARs and that they have ways to accurately assess their skills. STARs should be able to leverage their skills to move into higher wage work. We need to recognize that hiring practices that emphasize degrees over experience are blocking mobility for these workers. As we showed in this example, 15 percent of production supervisors have a bachelor's degree, while 37 percent of job postings are asking for one. So that brings us to the value of this work. It's important to understand in which cases credentials and licensing are serving as valuable skill signals. And, in which cases are credentials serving as potentially low value investments or additional barriers to entry. The ORS is going to be useful for understanding the extent that credentials and licenses supplant employer degree requirements. The demand side data on employer job postings is providing us the best indication of what credentials are most valuable. Even so, in any cases employer preferences are unclear and degree requirements will remain a barrier if we don't have a way to accurately assess applicant skills. Going forward, we want to continue to better understand employer demand for credentials, costs to workers, and time to complete.

JEFF STROHL: I'm going to take moderator's prerogative and throw the first question out, which is a great concern as we talk about non-degree credentials. The history in the US isn't pretty in terms of tracking by race, class, and gender, so we end up with occupational segregation. Ashley's work demonstrates that credentialism is part of the problem, but there's also other evidence and other work that suggests that short term skill-based occupations have less general education mixed in, which creates different levels of productivity. My question to the panel is, as we move into this new era, how can we utilize your work and short-term non-degree credentials to bridge equity gaps by race and class and sex in our in our economy rather than reinforce it?

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LABOR MARKET OUTCOMES OF NON-DEGREE CREDENTIALS

ASHLEY: We don't want to add additional barriers that are inhibiting people who can do the job from getting the job. To the extent that licensing requirements and credentials, in some cases have been shown to do that, that's a problem. It's like what Daniel was presenting about — the disproportionate usage of apprenticeships. I think the best way that credentials can be used to improve one's ability is to be based on skill. That's part of the value associated with credentials for STARs, the skill signal that has traditionally been devalued by employers. If a credential can allow them to better illustrate that they're capable of doing this work, that has huge promise for workers. To the extent we can create credentialing pathways that incorporate work experience, and that basically serve the skills signal need versus the skills gap, that will only be helpful. There are a good number of workers who have the skills, and their challenge is being able to signal the skills they have in a way that's valued and respected by employers. For example, I was speaking with my mom last night, and she's a STAR. She was in network security, working when all the credit cards rolled out and the only way she got her position - which was valuable to her - was that they ended up removing the degree requirement and allowing you to replace it with five years of paid experience. So doing things like that would be useful.

DANIEL: There are two things I'd say. We all like our quantitative data but something that's helpful in advancing equity is implementation research — going into programs and asking how people hear about the apprenticeship program, what's the intake processes like, what they struggle with when they're there. Complementing the impact work with that kind of understanding is very important. Then, just hammer the occupational segregation point home because it's important to keep in mind— it's bigger than these credentials have lower earnings for women, for example. It's not something that's directly a part of apprenticeship, rather it's a sign of occupational segregation that we see if we look at national occupational data as well. It's a tougher nut to crack. For that reason, because it's now always tied to the credential since all these credentials are so tied to occupations, getting a handle on occupational segregation is important.

MATTHEW: I'm not sure I have a lot more to add. The private literature has shown that there's evidence of sexism in the labor market and one of the hypotheses that people examine and have identified is that employers believe that women have less of an attachment to employment and are more likely to leave the labor force. Employers then are less willing to invest in them and credentials can serve as a signal there. It's unfortunate and it shouldn't be necessary, but given that state of the world, credentials can serve for women to signal their attachment to the labor force — to employment and that's one of the ways in which it helps narrow the pay gap.

NCRN MEMBER: David, from the BPS work you presented, do you have a breakdown by race?

DAVID: Yes, we were able to look at race and ethnicity in that report.

JEFF: Have they been consistent in their race, ethnicity definitions across the BPS for anyone who's interested in any type of trend analysis, or they should just take a closer look?

DAVID: They have been consistent enough for trend analysis. Of course, those definitions, those categories, are very mutable and evolved over time. But there's enough overlap and consistency to look at trends over time.

NCRN MEMBER: One of the things we've seen in the last couple years is this big step back from the labor force from women. I want to return to the occupational segregation question as it relates to the availability of childcare. There are certain occupations that have second and third shifts where it's very hard to arrange for childcare. Has any of your research investigated the relationship between availability of childcare and shift work, or if you know of other people looking into this? From a practical standpoint, in terms of work that we're doing with industry associations and other groups on apprenticeships, we're wanting to expand them to be more accessible to women, but childcare may be an issue.

DANIEL: That's a good example that brings together the two points I made in implementation research. You go out and ask what kind of supports you provide that help with retention of apprentices, and the two that come up all the time are childcare and transportation assistance. The way these programs are designed, they can put a portion of their funding to childcare and not everybody needs it, but some participants use it and it does help remove barriers but this also gets to my frustration about focusing on these grant programs. They have it and that's great, but how many other apprenticeship programs have that available, what kind of barriers outside of these well-funded programs are out there? We don't know. It's not in RAPIDS but the work we've done suggests it's consistently important, consistently coming up.

ASHLEY: One project we've done recently is looking at what's often being referred to as dual customer training (DCT). This is when organizations are working to engage employers having them involved in shaping the content of the training program, but also providing services direct to the worker. We look at those trainings, look at the capacity of those programs to serve low wage workers who are often disproportionately single parents or have young children, and we found that very few of them offered what we would call material support. And even of that material support, very few had childcare, I think it was a couple out of 200. A few had transportation subsidies, but I would not say they were doing an overwhelmingly good job of meeting the needs of people seeking training.

DANIEL: If you're not familiar with Claudia Golden's research, there's the childcare side of the problem, but I think the flexible scheduling and control over scheduling also matters a lot. Beyond childcare, there's a Lumina-funded initiative that leads into the administration's new work on a Good Jobs Initiative. One of the things they're looking at when identifying good jobs is the ability to control your schedule, so that's a critical addition.

NCRN MEMBER: Ashley, can say a word about differences across industries?

ASHLEY: Yes. We're not doing anything at this point that's novel on certifications and licenses, but I can certainly pass it along that our results are from the Bureau of Labor Statistics from the same that others are using, the CPS. They've added some questions on licenses and credentials, but it varies by occupation. They found differences by education. We have the top licensed and credential jobs — they tend to be more professional degrees. Registered nurses were one of the ones, and so were licensed practical nurses. When I was looking through to think about STARs, particularly the health care occupations tend to be more heavily licensed.

NCRN MEMBER: How confident are we in the job postings we're using in a lot of this research? Are they valid? Are firms really hiring what they put in those job postings? And do employers even know what skills they need for the job postings?

JEFF: I've done a lot of work in this area and feel that the Bureau of Labor Statistics should start

publishing the signal-to-noise ratio on Internet job postings because vendors are not motivated to provide any kind of error information about the data. For instance, 40 percent of job ads have educational requirements. Work we've done demonstrates, like Ashley's, that the difference between the ask and the incumbent education is immense. If we think about occupations, we're talking about the CPS with internal inter-coder reliability of about 80 percent between trained coders. Just imagine how much noise you get out of the machine read —and nobody is looking at whether the data is of quality. The vendors tried to sell it at the zip code level, but it is not reliable at the zip code level.

NCRN MEMBER: I was looking at apprenticeship programs some years ago, interested in the number of people who apply and who did not get accepted. There might 500 people applying but they pick 10. My question is, for the 490 who didn't get one, could they just not do the job? What are you telling them to do? Where are they going? I feel like we're losing a huge number of people because there are not enough slots for apprenticeships. Is anyone looking at the data and who doesn't get into the programs? What happens to them next?

DANIEL: There is no data on it but it's an important problem. Some apprenticeships are more competitive than competitive colleges. Bob Lerman likes to talk about how in the UK the Rolls Royce apprenticeship program is more competitive than Oxford University, and though that's an extreme case, there are similar examples out here. I think a big difference is whether it's an incumbent worker program or not, and so we've been just tracking that and whether not getting in the apprenticeship program means you're not getting the job or if you're just waiting on the training for it in the future. It's a big black hole in the in the data and the research.

NCRN MEMBER: The programs know how many people applied and they know who got in and they gave them an assessment.

DANIEL: There's no way to assess the size of that in a systematic way.

JEFF: We just found a new piece of work that the NCRN needs to do. As we start to think about putting a credential on everything, hours work, experience, etc., to help people navigate the labor market, do we run the risk of cluttering the signaling so while it is we might have credentialism—the BA has a good signal, it might be just habits, noise, and so on but it also has its efficiency—so I'm wondering how we find a "mini max" solution here to help people move through the labor market with accurate signaling for employment, productivity, wage gains, wage transparency, but not create a Tower of Babel.

DANIEL: This is a big concern on apprenticeship, specifically with respect to registered apprenticeship. A least the registered apprenticeship is reviewed by somebody at the Office of Apprenticeship or a state apprenticeship agency. We know there's nothing magical about registration — it's work-based learning that's pedagogically really driving this. But if nobody's overseeing the registered apprenticeship programs, there's a concern that expansion through that route might dilute the signal of the registered programs as well. It's important to be clear in the apprenticeship space about what it is, what's expected of it, what a standard length is. The occupational competencies across registered and unregistered are important to keeping the signaling value of apprenticeship.

ASHLEY: I don't think I have a nuanced take on that. I think it really comes down to employers driving what they're going to find valuable. What we want for workers is for them to be able to find employment and upward mobility throughout their work lives. If employers are saying what we really like are all these little sorts of credentials, and it's on the worker to go and search to find them and stack them over the course of their lifetime, that's more of a question for us to understand from them.

JEFF: How about we try to move a high school worker with 30 years of experience to demonstrate all the skills, how do you do that, is it going to be at that occupational distance metric? Like, I've got a portfolio of skills that makes me valuable for that," how do we get there, and how does that not multiply into many credentials that create that portfolio of skills, how do we help that worker using these non-degree credentials, make that move and demonstrate without creating a Tower of Babel of too many credentials. Do you all have thoughts about that?

DAVID: I've never heard the Tower of Babel label, but I think it's a nice one. I often think in terms of the Wild West, just complete deregulation of the certification landscape. Employers do play an important part in that —a lot of it can be demand driven — demand for labor, especially on the part of large employers. The national (and international) ones can set standards and other employers can latch on to that. There's also potentially a role for the government to not require but endorse different kinds of certifications in key industries, and then endorse them for their own employees. That can serve as a signal to other employers that "oh, this is one where we've seen evidence of value," so that not every single firm has to navigate that Tower of Babel.

NCRN MEMBER: As confusing as credentials are, we tend to be as confused about employers. A lot of the work that Opportunity@Work and others are doing is great but it's important to look at the small and mid-size employers as part of this. The work we've been doing with Jobs for the Future (JFF) and Society for Human Resource Management (SHRM) has been interesting in terms of that. Part of the solution may be for us to double down on this idea of the work-based learning component as part of these credentials because, while I'm all for apprenticeship and all in for registered apprenticeship — there is a continuum of work-based learning that, to the extent we can link that to credentials and make that a part of a learning environment and not just focus on our same six friends, which are the large companies, it's going to be really important at the local level.

NCRN MEMBER: You mentioned educational requirements. Is that something that can be linked up with the CPS data on licensing and certifications to try to understand what's being used to enter occupation versus doing additional qualifications?

ASHLEY: Absolutely. The big difference is that the ORS is at the occupation level. But it's using your standard SOC O*Net codes — so you would then look at the respondents in the CPS and see what job they're in, and you can say their job easily requires a credential, but they don't have one or they haven't earned credential, but their job doesn't require one. So, it can be useful for that.

JEFF: If I'm correct the ORS was done for or by the Social Security Administration for occupational disability purposes.

ASHLEY: The SSA funded it, it's fielded by BLS or Census.

7 PUBLIC POLICIES SHAPING THE NON-DEGREE MARKETPLACE

Five experts joined the 2022 Non-degree Credentials Research Network (NCRN) Conference, *Non-degree Credentials on the Move*, on April 28th to discuss Public Policies Shaping the Non-Degree Marketplace. Moderated by Rachel Hirsch, the panel included Dana Kunzman, Vice President of Strategic Innovation, Pennsylvania State System of Higher Education; Nick Moore, Director, Alabama Governor's Office of Education & Workforce Transformation; Cynthia Proctor, Director of Communications & Academic Policy Development, Provost's Office, State University of New York System; and Michelle Van Noy, Director, Education and Employment Research Center, Rutgers University.

Session slides are available here.

ORGANIZATIONAL INFLUENCES ON QUALITY IN THE NON-DEGREE CREDENTIAL MARKETPLACE

MICHELLE VAN NOY: Everybody knows that there is a rise of non-degree credentials and we're trying to grapple with the Tower of Babel in credentialing. We are trying to tackle this question and the challenge of quality, because there are so many non-degree credentials and so much variation across non-degree credentials, e.g., certificates, certifications, licensure, apprenticeships, and badges. Yet there is no single system or set of standards to help people navigate the system or understand what makes a quality credential.

Though there is not one standard, there is a lot of activity. Many organizations are thinking about this deeply but in different pockets of the field because the field is so disparate. As part of work my organization is doing with Lumina Foundation, we have been helping to map out some of those actors and think about the ways in which they are influencing the field.

Our landscape scan is mapping of the field and this work is leading us to define what quality in credentialing is. There are many different ideas

about quality, with many groups talking about some of the same things but using different words. When we walk about quality, for example, are we talking about value? Are we talking about the credential itself as it is designed, or are we talking about the outcomes that people get from it when they go into the labor market or for further education? We have some really good work to draw from. For example, **Lumina's Quality Credentials Task Force** looked at credentials more broadly, including degrees. Much of that work certainly applies in this non-degree credential space. The National Skills Coalition and the Education Strategy Group, also have robust work that was done with states directly that give us good guides. The Gates Foundation is investing in this as well in terms of its **Postsecondary Value Commission**, which focuses on outcomes and offers many good ideas here. At Rutgers, we have done some work thinking about quality, specifically focused on non-degree credentials. Looking across all these different ideas, there is the idea of looking at the credential itself: How is it designed? Is that high quality?

That gets into things like content, instruction, and assessment – a lot of things about the credential itself. And then we look at the outcomes: What does the person come away with? Do they have competencies? Do they get the job they want? Are they able to get further education? We think about those two things intertwined – and they are very much intertwined — but they really are getting at different issues and there are different levers to influence them. So, when we talk about these sorts of influences, we should think about all the different efforts in the field around credentials. A lot of them are oriented towards providing more information, which is useful because we don't know what credentials mean.

An example is the work on transparency led by **Credential Engine.** The concept of transparency and information is really based on the idea that more information will help different actors make more rational choices. If we put more information out there, that is valuable. At the same time, we also recognize there are other things at play among the institutions: the social structures, the idea of trust. So, we must think about other factors like these that mediate quality and value. This is where today's panel comes in, thinking about public policy and the role of public policy in credentialing.

How does funding influence how we think about quality? How can funding be a lever to influence quality in terms of requirements or restrictions and the kinds of credentials or occupations we think of as being valuable? Another is the adoption of different actors, after seeing what others are doing. When an employer says, 'I think this is a good credential', the next employer might say, 'I think that's good' too. They see that Google is doing this well, so they should follow Google's lead. So that's another mechanism at work. We are trying to step back and think about the different factors going on here and how they might work together.

We have tried to map out some of the key organizations in this area, those influencing quality and value based on some of those mechanisms that I talked about. We welcome feedback to improve our paper. What are the implications for us as we think about non-degree credentialing and how to have a more coherent oversight or quality assurance system? One of the challenges is the number of factors influencing these developments. How do we bring them together? How do we have conversations, coordination, and cross-transparency effort? How do we try to use similar language and think about different ways policy can be used as a lever in a consistent way? This could be with some of those standards from transparency efforts at other bodies involved in quality assurance. But a lot of this comes down to coordination. States as a locus of this type of activity could draw from the existing standards and quality assurance bodies that currently exist.

RACHEL HIRSCH: That is true. There are good opportunities with states to have those discussions, and then also with individual institutions in higher education – but it is about bridging that gap. It is a big divide, and we don't need to reinvent the wheel a hundred thousand times for every credential.

NCRN MEMBER: Your organizations can be grouped in different buckets based on the regulatory pressures we face. So, some of the value of short-term non-degree credentials is in the fact of being short and agile – our ability to change them. One mechanism that holds them back from change is accreditation. There were previous federal policy efforts to come up with alternative methods of accreditation that fell flat. Do you think we should just accept the system of having a bucket of titles that have their certain set of standards and another set that are more market-test oriented? So, if our perfect market works, then the credentials of questionable quality should all fall away? What are your thoughts on that, the speed of change and what can we do to help non-degree credentials add to labor market flexibility?

MICHELLE: This is tricky. I don't think anybody wants to adopt traditional accreditation standards in this arena because that would not entirely work or address the situation. We have an interesting opportunity to influence traditional accreditation because we're thinking differently about the role of credentials and what they mean. It's almost like it's not creating a new system, but it is an opportunity to think about what makes a credential valuable. It is certainly not divorced from the traditional accreditors because they are in this space and have a lot of value in what they do. I don't have a good answer to where that's going to go but I would like to see those conversations happen.

RACHEL: Michelle, your point about how states can really be a focus for bringing together many of these entities to work together and align their work is important. Our next speakers will be addressing directly what is happening in the states of Alabama, Pennsylvania, and New York.

ALABAMA'S SKILLS-BASED TALENT AND HUMAN CAPITAL DEVELOPMENT ECOSYSTEM

NICK MOORE: Alabama is a state that historically has not had as many people in the labor force or as much access to postsecondary education – same as many states in the south and across our country. So, what I want to talk about is the powerful impact of democratizing access to postsecondary learning through non-degree credentials and how we've got to think about doing that through a demand-based paradigm. It's not to say that we turn over everything to business and industry but thinking about this in a tripartite manner means we have job seekers and students, employers, and then training providers. The systems that I describe try to take advantage of the unique role that each of those audiences bring to bear here. So first, we have a postsecondary attainment and labor force participation goal.

We want to add 500,000 workers to our workforce. That will equal about 60 percent attainment. And we want to increase our labor force participation rate, to the national average by 2025. To do that, we have to open up new formats of learning that meet the needs of people, particularly in the postsecondary environment. The Georgetown Center on Education and the Workforce has done a tremendous amount of work looking at the value of non-degree credentials and their role in the postsecondary ecosystem. A lot of the work that Strada has done on the public insight survey, we have replicated at the state level.

We have found people aren't turning their back on postsecondary learning post-COVID but are looking for new modalities and stackability – they want not just non-degree credentials to be the currency in the workforce, but skills and competencies.

So, as we think about this burgeoning space, we also must think about different taxonomies for credentials and what the marketplace is going to be for skills and how we end up scaling solutions and competency -based education. That includes non-degree credentials and skills -based hiring. Our theory of action relies on both. So, we've set goals at the regional and state levels. We've made non-degree credentials and competencies the fulcrum of our public workforce system: every agency and region are held accountable. We're using that to set a vision statement, make sure that we're seeing people attain credentials equitably, and using things like our state's Eligible Training Providers List to lay a foundation so that we can form a "beachhead" for credential quality and transparency. So, quality and transparency are big topics.

It's important to include business and industry education, as well as training providers. These things aren't mutually exclusive. We don't need to end up in five years with another bifurcated system where we're tracking people in non-degree programs, and the degree world has continued to evolve on its own. When we're talking about quality assurance and transfer transparency, as well as transferability and interoperability, we must be sure that we're doing that at the competency level. But we've worked quite a bit to come up with a quality assurance process. And we have codified every credential in Alabama. We all know it's still the wild west and there's a million credentials nationally, but we've codified the 4,000 in Alabama that we know of.

We've got a goal by the end of next year to register at least half of those. Now, how do you do that? How do you get somebody to register a credential if they don't even know about it? Well, in Alabama, if you want your credential to be paid for using public dollars, you must at least register it. Then it gets a chance to be on our state's compendium. There are 10 quality assurance criteria, so a credential goes through a 10-point test, and it's classified then as well as given an alphanumeric number. So, we've got to think about how we end up with the "table of elements" for credentials, but not just statically.

We also must think about linking credentials to their competency statements. We're identifying credentials with all their attributes and then tagging competencies. We've worked closely with the Corporation for a Skilled Workforce and developed the Alabama Occupational Ontology that allows us, just like with the table of elements, to describe credentials with their attributes. This then gives us a foundation for a new type of learning that looks at skills as the smallest measurement. And we get past the proxy of time and credit hours as the substitute for true learning. This is not at all mutually exclusive from traditional higher education. In fact, it's of an existential necessity, particularly for community colleges and regional universities, to get on board with competency-based learning. The Ivy Leagues and the R1 institutions are going to make sure that you can earn a MBA from an Ivy League institution sitting on your front porch in Alabama, like I'm doing. But that doesn't mean that the place-based and regional need for our institutions is going to change.

It is becoming more and more important that when we're talking about the work between employers, job seekers and students, and our education training providers, that we are truly coming up with a regional credential and competency currency. We're going to be putting out our developed system for tagging the attributes of credentials and competencies together. However, we are not looking at the postsecondary system in isolation from the jobs in demand in our state. We've done some gap analysis on our Eligible Training Provider List programs covered by our four-year institutions who are working very closely with us on this. What we found is that, for a lot of our in-

demand jobs, there still is a deficit of programs to meet occupational needs. We're working to stack occupations together in dynamic career pathways, not the static kind of career pathways we've seen for years where you go from CNA to LPN to RN.

If you ask me or if I ask you, how did you get to where you are today, it is probably not one of those static career pathways. But if we thought about the competencies and the skills of the job that we started in and how those competencies led from one job to the next, then we'd probably arrive at a better understanding of how we got there. So, we've got a five-star rubric for evaluating every job in the state. We have come up with regional and statewide lists – jobs that are on the statewide list are on at least three of these regional lists. We've adopted this Urban Institute ETA Competency Model and have made it to where the bottom three tiers are what we call the "personal effectiveness" or "ready-to-work" competencies. A lot of people used to call these "soft skills, "we call them "employability skills." We're looking at everything from academic personal effectiveness to work-ready skills, and these are common to every job in Alabama. And we've got something codified called the Committee on Credentialing and Career Pathways that meets in 16 sector strategies, one for each industry. These sector strategies are Governor-appointed. They also have subject matter experts from state agencies and universities that put together the DNA for our in-demand jobs, using their own lived experience. Something we call the Governor Survey of Employer Competencies that is establishment based is used to get feedback from every employer. What all of this does is help us put together the dynamic pathways I described.

Then also think about how we unbundle modularized programs, short term career-specific programs, and how do we legitimize non-degree programs for the federal government so we can finally get short term Pell. I'm hoping that this work will help finally validate for federal policymakers that states do have the ability to maintain quality and transparency. We know that what we've done here is not perfect and we're willing to change but the next step is to get several states to adopt a similar system.

So, Tier 4 is what we would call the skills common to the entire sector. In manufacturing, as example, the skills in that sector would all be the same five pathways specific for that dynamic pathway. Tier 6 contains the occupation-specific ones. That's where the magic happens for that job. Tier 7 are all the licenses and credentials that are associated with that job. Then there are the management competencies if there are any for that in Tier 8. Our Alabama Office of Apprenticeship uses these competency frameworks to help establish competency-based apprenticeships. We want apprenticeships to move at the speed of businesses, so we set up a state apprenticeship agency and have had a market growth in the number of registered apprenticeships competency-based apprenticeships.

I'm going to close with what we hope will be a solution for scaling a demand-based talent ecosystem that also replicates that tripartite model of the three major user groups. That is our Alabama Talent Triad. It consists of a Credential Registry, and we have already launched this in partnership with Credential Engine and with some support from Lumina Foundation and several others. The second and third phases we are going to launch concurrently is our Skills-based Job Description Generator, and a Learning and Employment Record (LER). As a state, we have taken a different approach to where the LER is not just a proxy for the traditional resume. Rather, we must make the LER competency-based and interoperable so that it is not just the digital resume to where we're doubling down on credit and time. If you look at my transcript, it doesn't tell you what I can do. It just tells you how long I sat somewhere. Again, that's not mutually exclusive from higher education. We can do both.

That's where PLA and cross walking comes in. We want to take all our credit and time-based courses at every university, translate those, and crosswalk them

into competencies. If somebody earns a 3-credit hour course with known competencies at what proficiency level, they would then be able to present that assertion and have those competencies verified for their LER. That then opens us up to being able to do strong articulation agreements, not just traditional PLA where everybody has to give their blessing over every different PLA award. So, we can scale that. The Skills-based job Description Generator starts with a norm Competency Framework. This enables those three different user groups to sign on and get a different format, depending on whether they're a student or job seeker, employer, or education training provider. If I'm an employer and I don't like the Tier 6 competencies, I can choose from a bank of Tier 6 competencies with a search bar. You will not have to have a PhD to use this tool. And that's important because if we're going to get people to be able to use these things, we have to make it in their language. So, using the language of business and industry is key.

Then the third part that ties this talent system together is our Learning and Employment Record. The LER is beyond a digital resume, but it is also linked to a job board. It is like the match.com and Netflix for the workforce, where if I've got my LER and I look at a job and I'm an 80 percent match, then that will tell me, 'Yes, you're good for that.' The employer can set the net as wide or as narrow as they like based on geography and other settings. What this does then is take out for the user a lot of the inequities, trial and error, and word of mouth from HR – and link the user to opportunity. For employers, it is going to save them time and money by not having to go through a stack of 800 resumes to verify references and validate learning experiences. So, our next phase is doing a large marketing campaign about the value of skills- based hiring and competency-based education.

I appreciate you giving me an opportunity to share what Alabama is working on. We are going to be looking for an external evaluator for some of this work so if there is anyone here that would be interested in working with us, please let us know.

NCRN MEMBER: Given the massive amount of work to put this together, how will you keep it refreshed and updated? That's a key challenge in making the system relevant for providing career advising, training advisory, and keeping pace with the needs of employers. How do you think about that issue in your ontology, your mapping, training programs and so on?

NICK: That's a great question. The answer to it helps us get past the "field of dreams" model of developing credentials that we have right now where we try to assume what the employer wants. That doesn't always work. What we're trying to do is iterate every year through our industry sector strategies. We have established technical advisory committees to reassess our list of in-demand jobs, credentials, and those competency frameworks. We run the survey every year. Unless something major changes, the fundamentals of that list don't change a lot; but there are some variations and that's important so that it does stay up to date. It's important for individuals to make sure that they've got the best shot at getting the strongest return in the labor market. It's important for employers too, to legitimize and validate the work we're doing, and have the employers and the education training providers work hand in hand to develop those products. I think it is important not to set up a divide between who's producing that work.

NCRN MEMBER: I often find that stackability and career pathways are kind of wishful thinking, and your architecture is great, but how do you plan to evaluate whether you're getting it right? What role do labor market outcomes play in that? And is there any hope that Alabama might get occupation under their wage records? That would be critical to measuring whether you can identify a career pathway because industry doesn't do it.

NICK: We have set up a state longitudinal data system; We were one of the last states to set one

up. Our formative research question is about looking at the ROI of non-degree credentials using longitudinal data not only at the population level, but also looking at the propensity of one program. If we can break that down, we look at the skills. So, we can match the longitudinal data on wage records, with the skills shape of the program, and then try to identify if someone in a field like healthcare, where they didn't progress all the way but a lot of their skills and opportunity level jobs translate over into insurance or advanced manufacturing did so. We're trying to figure out if we see a larger number of people that matriculate from one job into the next, with a larger ROI. Using longitudinal data overlaid with competency data in each high-demand jobs and programs based on people moving through them should enable us to evaluate our career pathways.

NCRN MEMBER: What sources of information do you plan to use to create this Registry of Skills?

NICK: We use our primary labor market information from our Department of Labor. There's a lot of great secondary sources but if you really want the best look at what your state is doing, you must get the primary labor market information from not only the Title programs, but the UI wage records — it's imperative. Of course, we look at other national data sets, but they are usually incomplete. That's why it's so important to look at your own data.

#PREPARED4PA: PREPARING PENNSYLVANIA'S WORKFORCE OF THE FUTURE

DANA KUNZMAN: I work for the Pennsylvania State System for Higher Education Foundation. I am not a researcher but come from the foundation side of things—we are the advancement engine for the state system. I will share with you more of a lens around rolling out a strategy through advancement and fundraising.

Similar to everywhere else, Pennsylvania is experiencing a severe talent gap. We struggle to recruit and continuously hire an educated workforce to remain competitive. The state system and its universities are committed to preparing the talent that powers our economy to help advance equity, expand opportunities, and increase educational attainment. We believe that an effective talent strategy solution lies at the intersection of education and workforce development with the opportunity to collaboratively accelerate and scale efforts for graded, coordinated impact. We're working closely with the Department of Education as well as the Department of Labor to minimize the silos. The talent gap cannot be filled with our regular 18-to-24-year college-going students alone. So it's essential that our strategies and programs include increasing the educational attainment level of low- and middle-income individuals, underrepresented minorities, and adult learners. An affordable career-relevant postsecondary education will be the engine of social economic mobility.

To meet Pennsylvania's workforce needs, we must significantly increase the number of adults with postsecondary education and develop innovative solutions to meet the students where they are. It's not really about competition, but rather enhancing our relevancy and being career-ready institutions. Although people may feel we're competing with the community colleges across the state, for us, it's about making sure that individuals who can tap in and out of educational experiences have equal access to those opportunities. This is really a 21st century strategy that better connects higher education and industry levels across all levels and builds a stackable career pathway that incorporates certificate pathways and credentials.

To this end, PASSHE has been leveraging opportunities to be part of the state's solution. We're continuously fostering partnerships to improve educational pipelines into high priority occupations that have been identified, to ensure that our workforce is prepared for the jobs of today and tomorrow. As we started on this long journey, we had funders and partners like the Council of Adult and Experiential Learning (CAEL), Lumina foundation, Strada Education Network, and several different higher educational institutions, not just the 14 state owned universities in Pennsylvania. Our lifelong learners are obviously at the table: upskilling and reskilling adults, non-traditional students, stop outs, as well as underrepresented minorities and our first-generation students. There are also our regional stakeholders, the workforce assemblies that have been involved through with employers, workforce development boards, training providers, postsecondary educators, cross section of industry groups and the philanthropic arena.

Our "how" is broken into two phases. Phase one has been about building the groundwork which entailed a lot of research and data from a statewide perspective. Starting in 2019, PASSHE brought together senior business leaders, human resource professionals, subject matter experts from across industries, government educational industries, and national funders. A statewide steering committee and regional working groups were formed. Then regional assemblies were held across the state. The state system actively engaged a diverse set of voices to gain a better understanding of the skills and competency gaps from the demand side of the statewide labor market. This effort was data driven with a great deal of listening and learning., By listening to employers and industry leaders, we uncovered insights into new opportunities and identified new ways to address the critical workforce needs through collaboration.

Through this process, we wound up with three deliverables. The first were the Competency Maps that were built with CAEL. The work of these regional workforce assemblies drove the alignment of the employer-validated competencies and skills needed for successful transitions in the workforce across six identified in-demand industries. Second, there was an Employer Engagement Action Plan which was created to provide the state system and the workforce partners with ideas, tools, resources, and action plans to continue supporting the state's workforce. Finally, we created an RFP that was developed to elicit in-demand credentialing programs with the goal of meaningfully linking education and industry, enabling PASSHE to build a robust talent pipeline. The RFP entailed bringing a lot of funders to the table to make sure there were jobs at the other end.

All of these have enabled PASSHE to become a key driver in creating innovative, short term, diverse, equitable, and inclusive credentialing programs. Individuals across Pennsylvania can participate in the pilot programs that will track directly into high-demand industries, intentionally target diverse populations, further career aspirations, and improve the trajectory of lifelong learners. Also built into that process through the RFP, there was a guaranteed evaluation through a rubric that was created using external partners. So, with the industry cluster competency maps I mentioned, we did a deep dive across the regions and CAEL helped us develop the industry maps based on the identified skills needed across employers. Those were advanced manufacturing, energy, agribusiness, finance and insurance, healthcare, and information technology. Each of these competency maps today continues to inform industry-validated training and educational programs designed to help build the talent pipeline.

I want to highlight a few policy implications. We are now able to have conversations with labor and industry around processes, not necessarily policy per se, that could better align demand and our ability to move into the credential space in a more streamlined process. Also, more specifically around energy, we needed to address an alternative because Pennsylvania legislation took fracking

off the table. So that's an example of the regional nuances we deal with. We are not just presenting and looking at the data from a statewide lens, but understanding solar farms versus electrical vehicle plug-ins.

I will mention three different pilots that we're currently rolling out of the RFP we generated. The first is at Millersville University. They are diversifying the mental health profession with career pathways for immigrants and refugees, providing an on-ramp for immigrants and refugees to gain entry level employment in the mental health profession.

Second is around agribusiness at Shippensburg University. This is a unique collaboration between regional agribusiness employers, multiple higher education institutions (community colleges and universities), not just PASSHE at the table. Together, they're delivering an eight-week non-credit online, synchronous, and asynchronous front-line leadership credentialing program. They're paying for the students to go through the program and guaranteeing employment at the other end as well. What we have found to be critical is whether a current student or adult learner returning, they need the funding support and wraparound services to help them go through these programs. So, we are working with national companies to help bridge those gaps.

The third pilot is at Chaney University where they are building a workforce enhancement network in cybersecurity to eliminate disparity in historically underrepresented and under-served populations in the field of cybersecurity.

Finally, we see Prepared for PA, which is the tagline for what this initiative is, and this is just the beginning for the PASSHE institutions. In fact, we're in the early stages of working towards achieving credential transparency. PASSHE began working with CAEL to further explore the alignment between university curriculum and in-demand industry certifications, and to look at prior learning assessment. In this process, we hope to better prepare students for future job opportunities and stackable credentials while also improving the university's abilities to specifically support employers. We're also building upon the infrastructure to create a Credential Registry so that we can provide information about quality credentials, market data, job openings, job descriptions, information, and return on investment. The goal is for the centralized process to bring all partners in alignment, driving policy, driving funding and support for the programs, ultimately providing information that's learner-centric and easily accessible. One of the strategic priorities for Pennsylvania's Master Plan for Higher Education is to increase transparency and the value of postsecondary credentials to individuals, communities the universities serve, and the Commonwealth. Hopefully this will provide policymakers with robust information that will allow them to invest in the economic vitality of the state.

We're also exploring a predictive analytics-based service to define and recruit non-traditional students for degree certificate training programs. We believe this is essential for connecting learners and credential providers. So, bit by bit, Pennsylvania is working on building a connected learn and work ecosystem, bringing education and employment together and transforming its education and business models so that we can sustainably drive economic development and social mobility into the 21st century.

SUNY MICROCREDENTIALS: GROWTH OVER TIME

CYNTHIA PROCTER: I am from the State University of New York system (SUNY). We have 64 campuses and 31 offer microcredentials to date. There are certain parts of the state where we don't have good coverage yet. In the northernmost part of the state and the western-most part, campuses are developing microcredential programs. Every sector of the system is offering microcredentials: universities, community colleges, technology colleges, comprehensive colleges, and our doctoral degree granting institutions. That includes our R1 research universities. It also includes the Upstate Medical University, one of our medical centers, and it includes our specialized institutions like our College of Optometry. Sixty-four percent of our microcredentials are for credit, and 66 percent stack to degree programs. We have microcredentials now that stack to the associate, bachelor's, master's, PhD, pharmD, DDS, OD, and MD.

We started talking about microcredentials in 2015. This process takes time when you want to affect change across a system the size of SUNY. We're fortunate to have one board of trustees with oversight over the academic programs at all institutions. So when we want to affect change, we do it through board policy and that is a shared governance collaborative effort at SUNY. We always start with a university-wide task force. And we have broad representation from our small campuses, large campuses, rural, urban and every department or sector like finance, registrar, presidents, provost, continuing education, workforce development, financial aid. It took three years to get a policy passed and it was not easy. But we were informed by the work of Lumina Foundation and others around microcredential developments. The policy was adopted in 2018 when we had two campuses and 21 microcredentials. We then saw tremendous growth from 2021 to 2022, in part, because campuses realized that microcredentials were a tool to serve those impacted by the pandemic. There were those who were unemployed, underemployed, and those coming back to work realizing they needed a change.

We stand now at 432 microcredentials across 31 campuses which means that not every campus has a lot of microcredentials. Four institutions have one microcredential. Our largest campus, which is one of our research centers, has 69 microcredentials. We do see a pattern of growth from 1 to 5 microcredentials which is usually where campuses start. They see how this works. Then many move from 5 microcredentials to 10 or 11. That's where they're really testing their local policies and procedures, getting initial feedback from students, faculty, and partners. Then we typically see growth from 11 to 15 to 16 micro-credentials and they will stay there, working to build efficiencies and focusing on marketing.

We spent more time getting faculty on board and getting the policy right than we did with marketing. In 2018, all of this was still new. It was a little bit like letting a thousand flowers bloom. So, several campuses started with microcredentials for existing students in existing degree programs to help motivate them to persist. Campuses also developed micro credentials that would provide skill sets complementary to the major. The result is that SUNY has microcredentials in over 60 disciplinary areas. Business is the most prominent, followed by health and healthcare, education, computer science, data science, and many other fields. We have a growing number of microcredentials in priority or emerging areas for the state renewable energy green building.

None of this growth would have been possible without the SUNY policy. You can see the components of our policy in our PowerPoint slides. Our faculty really wanted to make sure that SUNY microcredentials would have the same quality as our certificate and degree programs. To ensure this, we needed to have a SUNY- specific definition of what a microcredential is. The policy also said that

we would have guiding principles for development of microcredentials, and for the first time in SUNY history, we would have local approval through faculty governance provided that the Policy Framework was followed. This sent shockwaves across SUNY. But we really considered microcredentials much in the way we do minors, at least at the start, because most of the microcredentials were comprised of courses from degree programs that were already registered. Because minors do not need to be approved by the SUNY system or our state education department, and campuses have some flexibility in course development, we thought this was going to be well received by campuses. In fact, they didn't like it. They called up and said, 'Well, wait a minute, where's the forms? And where's the process and what do you want us to do?' So in 2018, it became my job to travel around the state to our campuses and work with faculty governance in developing high quality micro credential programs. Other parts of the policy are focused on collaborative development, as well as transparent and effective communication, allowing for multiple types of microcredentials to serve multiple audiences.

I can tell you today that when we go to update this policy, which we will in the next year or two, there are things that we missed. One was data reporting and collection. I did not realize when I asked for demographic data — race, age, gender, income — that we were tracking for persistence and completion, tracking what happened after a student took one microcredential. Did they take another, did they enroll in the related degree program, etc.? I didn't realize that for non-credit data collection, this was going to be completely shocking. For our registrar, my suggestion of collecting this in our student information systems also went over poorly. However, as the program grew, I think everyone began to realize, 'Hey, yeah, okay. We can do this.' And in fact, we had 11 brave campuses who piloted four credit and non-credit microcredentials in the student information system. They tested it, it didn't break, and no registrars died. Now we're bringing the rest of the campuses on board. When I talk to other universities, I say: 'You've got to be addressing that right from the start.'

The second thing we talked about was communication, but we didn't talk about marketing. We built these programs, but how are we going to get people to come? For SUNY, we're always in the mode of diversity, equity, and inclusion— it's integrated in what we do. But we didn't specifically incorporate into the policy ideas of access, diversity, and outreach to the most at risk. That is part of what we're doing but it is not explicit in the document. We should have added it explicitly, or we will in the SUNY-specific microcredential definition. Every microcredential for credit and non-credit has to go through a faculty governance process so we do have expedited processes and procedures related to microcredentials and are able to be responsive. Every microcredential whether non-credit or credit has learning outcomes, assessments, examples of student work.

New York also has a comprehensive, complex workforce development system. We have our Department of Labor, an Economic Development Corporation, Regional Advisory Councils, and Workforce Investment Boards. I made it my priority that the moment that we knew we were going to pass this policy, we started doing presentations to the Business Council of New York state — who just this week recognized SUNY's microcredential program with our first ever business innovation award. So talking to them from the beginning paid off. I presented to a Chambers of Commerce meeting with groups of employers, met with community organizations, and K-12 districts. We were saying: 'SUNY is doing this; we're working on this. Let me keep you up to date on what we're doing.' This approach has really paid off for us.

Our integration with business and industry is tight; we have very clear partnerships. We include over 30 of our microcredentials in embedded certifications, everything from the FAA license to be a drone

pilot to preparing you to be a teacher's assistant, a security guard, or Google employee. We were very conscious of bundling related education around the certification. So if it's already a nationally recognized certification, it doesn't need to be a microcredential— but you still can add coursework around it, bundle it to add more value for the student to help them stand out in the marketplace. We also have microcredentials that include internships.

Stackability is important. Our goal is to have microcredentials provide immediate value but also serve as pathways to multiple audiences. I've been working on the building blocks of high quality microcredentialed programs. I think that our criteria may be too simplistic but, based on our growth, these are the characteristics we have been looking at: 1) accessibility for students to apply and register; 2) are people aware of the program, 3) what is the enrollment, 4) how many microcredentials are you offering. 5) are they stackable, 6) what's the mode of instruction, 6) completions, 7) stackability, 8) cost spread across the campus alignment to local market needs, 9) number and type of partnerships.

We also can look at hiring and salary data. SUNY is fortunate to have a partnership with the Department of Labor. We can track if a student stays in New York state, if they're employed, what sector they're employed in, and their salary at two, five, and ten years out.

Here is an example of how we use this information. We can see that the National Science Foundation funded a community college to develop three microcredentials in remotely piloted aircraft systems. There are multiple entrance and exit points. The student can take one and leave and they still have enough skills and competencies to get a job. The more skills and competencies, the more jobs that open to them. Then if we add in the general education coursework and the capstone, the student has an associate degree. That's very common at our community colleges.

We're mapping each of our microcredentials that talk about salary, data, and job openings like this at the undergraduate and graduate level. A student may have earned enough skills to get that promotion or be ready to start in his/her career. But it's 9 credits toward the master's degree or 6 in an internship toward the bachelor's degree requirement. For the educational component of apprenticeships in New York, we're using 4-credit microcredentials so students will not only get their Journey Worker credential but credit toward a degree program. And we're working on the Credential As You Go program to develop incremental credentials. Once we hit 400 microcredentials, we developed a new website and we're working on a new searchable directory.

At **SUNY**, we are helping students sort through our 400+ microcredentials. There's also a link to go to the campus to register. Our Governor was impressed when she saw this and issued a press release noting that SUNY's program is being aligned to her priorities to serve businesses and adult learners. The President of the Business Council, the Commissioner of the Department of Labor, and the chairs of our higher education committees were all quoted in the press release because we had been pounding the pavement and informing them every step of the way. And that resulted in just recently, the first ever part-time Tuition Assistance Program (TAP) for non-degree credentials. And there are some caveats we have to comply with to get that funding, but that's where we are.

THE GEORGE WASHINGTON UNIVERSITY

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