NEW DIRECTIONS FOR NON-DEGREE CREDENTIALING RESEARCH

Report of the Non-Degree Credentials Research Network

Spring 2021

FUNDING

The NCRN would not exist without the generous financial support of Lumina Foundation.

THE GEORGE WASHINGTON UNIVERSITY

GEORGE WASHINGTON INSTITUTE OF PUBLIC POLICY

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EXECUTIVE SUMMARY

Non-degree credentials (NDCs) are becoming a common fixture of labor markets worldwide. Ranging from certifications issued by trade or professional associations to university-based microcredentials, apprenticeship programs, and digital badges awarded for completion of compact learning modules, NDCs are popping up on resumes and job applications in nearly every occupation and industry. For some workers they are becoming a substitute for post-secondary degrees.

The Non-Degree Credentials Research Network (NCRN) is a community of scholars and practitioners organized by the George Washington Institute of Public Policy (GWIPP) at George Washington University. Over the past two years, the NCRN has – through regular meetings until the onset of COVID-19 and a robust webinar series since then – provided a forum for researchers whose work focuses on NDCs to discuss their work and collectively shape a research agenda for answering the many unanswered questions about NDCs and how they fit into evolving labor markets.

This report describes the progress that the members of the NCRN have made in their research over the past two years, the lessons learned from the network's meetings and other activities to date, and, perhaps more importantly, the most pressing research questions that remain. In order to help what has thus far been a fragmented field of research move forward, we have identified 15 distinct research questions that we believe should be a priority for the research community. These include questions about who benefits from different types of credentials, how to identify high-quality credentials, how employers are using credentials, and how policymakers can improve the value of NDCs for all parties in the credentialing marketplace.

In the unprecedented wake of the COVID-19 pandemic and mass unemployment that has accompanied it in much of the world, governments, employers, and other stakeholder organizations are increasingly looking to NDCs as potential tools to help workers adapt to structural changes in the world of work.Research conducted by NCRN member researchers highlights the potential benefits and pitfalls associated with turning to NDCs in this unprecedented economic environment, including the consequences of encouraging NDC attainment for labor market inequality.

This report describes several areas of unmet needs for data on credentials, credential-seekers, credential holders, and employers that credentialing organizations and government agencies could help researchers identify and obtain. It also describes the need for more resources to be devoted to research in this area, including investments on the part of government agencies and the private and nonprofit sectors.

A major purpose of this report is to share the lessons learned through NCRN with employers, educators, career coaches, policymakers and others who have a stake in the effectiveness of the credentialing ecosystem. In disseminating it widely, we hope to stimulate the many organizations working to shape the credentialing marketplace and ensure that NDCs contribute to a more prosperous and equitable economy.

INTRODUCTION

In the world of workforce credentials, academic degrees have long commanded the lion's share of attention among policymakers and researchers alike. Yet, non-degree credentials (NDCs) – including certificates, certifications, licenses, apprenticeships and badges -- perform significant functions in the careers of millions of workers, including but not limited to motivating their learning, documenting their skills, and enabling social mobility. Despite the importance of non-degree credentials, we know little about them. We need a clearer understanding of how students, workers, employers and governments view and use them, how they vary in quality and value, how and why they are expanding, and what their potential is for facilitating reskilling, employment, and re-employment.

The Non-Degree Credentials Research Network (NCRN) was established to address this gap in our understanding of role of credentials in contemporary labor markets. This report documents the progress the network has made during its first two years and suggests future directions for the research community. First, we provide an account of the network's creation and evolution, including lessons learned along the way. We then identify current areas of research within the network, the major questions that remain unanswered, and the kinds of research still needed. We will conclude with a discussion of the implications for education and training providers, employers and their associations, and federal and state policymakers.

Background

The NCRN began as an informal group of researchers at George Washington University's Institute of Public Policy (GWIPP), Georgetown University's Center on Education and the Workforce, New America's Center for Education and Skills, Workcred, the National Skills Coalition, and the Census Bureau. The well-attended meetings of what was informally called the "Sub-Baccalaureate Research Network" in 2017 and 2018 provided a space for the presentation of research on topics related to non-degree credentials, including the labor market value of certifications and licenses and the use of non-degree credentials in state workforce development efforts. From these meetings it became clear that there was an unmet need for such opportunities within the non-degree research community as well as interest in a broader

and more formal network. GWIPP took the lead in developing a plan and grant proposal, and Lumina Foundation awarded it a two-year grant in late 2018.

An important step in the network's development was the formation of an advisory council of distinguished experts on credentials. At its first meeting, in January 2019, it was decided that we would engage stakeholders from the outset rather than wait until the end of the network's initial grant to share findings. That decision shaped the first meeting and resulted in a greater degree of stakeholder involvement than was initially envisioned for the NCRN, which is stimulating new ideas for both researchers and stakeholder organizations.

The NCRN's first in-person meeting was held in April 2019 and brought together a selective group of researchers and stakeholders from around the country to participate in a series of panel discussions and breakout sessions related to the research needs of five distinct stakeholder constituencies (state policymakers, federal policymakers, higher education, non-academic credentialing bodies, and employers) with the goal of stimulating and inspiring research ideas on the part of the researchers in attendance. To ensure a common base of starting knowledge for all participants at the meeting, a scan of published research was prepared by the GW project staff focusing on questions related to the attainment and value of NDCs.This document, available on the GWIPP website, was intended to be a baseline – a statement of what has been done that the NCRN and its members might aspire to build upon.

The NCRN's work continued with a second meeting for researchers in August 2019, which was focused around six clusters of common interest to the network in which members' interests were found to overlap upon analyzing a survey of the entire network. These six workgroups focused on the following topics:

- *Employer Perceptions and Policies Concerning NDCs*

- *Equity in NDC Attainment and Outcomes*

- *Career Pathways*

- *Technological Change and Future Skill Requirements*

- *Institutional Strategy Concerning NDCs*

- *Quality Assurance for NDCs*

At the August 2019 meeting researchers also participated in a guided discussion of the structure of federal government data collection initiatives related to NDCs and, with the leadership of GW research professor Andrew Reamer, identified strategies for influencing federal data collection efforts to ensure that existing and future surveys capture data of relevance to the research community. These discussions identified the National Science Foundation's National Training, Education, and Workforce Survey as being of particular interest, which promises to build upon the Adult Training and Education Study and provide a representative overview of the attainment of NDCs in the workforce.

In the final meeting prior to the COVID-19 pandemic, the research network met in January 2020 for a series of research presentations by NCRN members, updates on fed-

eral data initiatives, and dialogue about barriers and opportunities for further collaborative research. In May 2020, the NCRN decided to put in-person meetings on pause for the remainder of the year in favor of meeting on a biweekly basis in a webinar format. These webinars have been better attended than the in-person meetings that occurred in the network's first year. While not ideal for fostering free-flowing conversation, they have proved to be an efficient medium for NCRN researchers to share their work and solicit feedback. Webinar speakers and discussants have included researchers such as Sean Gallagher, Stuart Andreason, Iris Palmer and Heather McKay. In addition, members of our stakeholder network have joined our panels - including Denise Roosendaal of the Institute for Credentialing Excellence, Gardner Carrick of the Manufacturing Institute, and Kenyatta Lovett of the State of Tennessee. We also hosted a virtual plenary to discuss the effects of the pandemic on the practice of research for non-degree credentialing scholars and new research questions motivated by current events.

The NCRN's three in-person meetings, the first of which is pictured here, provided unprecedented opportunities for non-degree credentialing researchers to discuss potential areas for collaboration and provided an intellectual foundation for the network's activities after transitioning to an online format for the duration of the COVID-19 pandemic.

CLUSTERS OF RESEARCH

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Our research network is diverse in its interests, but most of us fall into one of several topical clusters in our work. A first attempt at defining clusters was made at the August 2019 NCRN meeting, as described above. After further investigation, which included interviewing many of our members as part of a research interests inventory in Spring 2020, the following topics were identified as the primary foci of the research community.

Appreciating the Landscape of Credentials

Many NCRN members devote some portion of their work to helping us understand the overall distribution and diversity of NDCs, including differences between NDCs with respect to quality and rigor. An ongoing effort on the part of Credential Engine seeks to count all credentials – degree and non-degree – in the United States and establishes an innovative methodology for estimating the overall population of certification programs by extrapolating from current data. A framework for assessing NDC quality developed by the Rutgers Education and Employment Research Center, represented in the NCRN by Heather McKay and Michelle Van Noy, describes how Credential Engine's wealth of data could potentially fit into a more comprehensive effort to identify quality NDCs. Similarly, a project involving several NCRN members from the GW Institute of Public Policy, Workcred, and the Corporation for a Skilled Workforce is using mixed methods to illustrate the diversity of approaches to professional certification. This project is expected to build upon the work of Tamar Jacoby and NCRN stakeholder organization The Conference Board on the potential value of certifications as drivers of upskilling in the United States.

Other NCRN members focus on understanding the landscape of credentials in particular fields and variation in the nature of NDCs between fields of study. Some of the University of Virginia Biocomplexity Institute's efforts in recent years have also been devoted to understanding the landscape of credentials in the skilled technical workforce, which were conducted in collaboration with the National Center for Science and Engineering Statistics (represented in the NCRN by John Finamore and Gigi Jones). Research in this cluster also includes work completed by

the Georgetown Center on Education and the Workforce, represented in the NCRN by Jeff Strohl and Artem Gulish, pointing to substantial differences between credential types in commonly pursued fields of study and emphasizing that certificates tend to be much more aligned with occupations than associate degrees.

Estimates of the Number of Industry Certifications in the U.S.: Scholars have often disagreed on how to define non-degree credentials and the appropriate data sources to use for studying them. The chart below shows how estimates of the number of distinct certification programs in the U.S. have differed over time. While the vast differences between estimates can be partially explained by different counting methodologies, a general trend in the direction of more certifications over time is clearly visible.
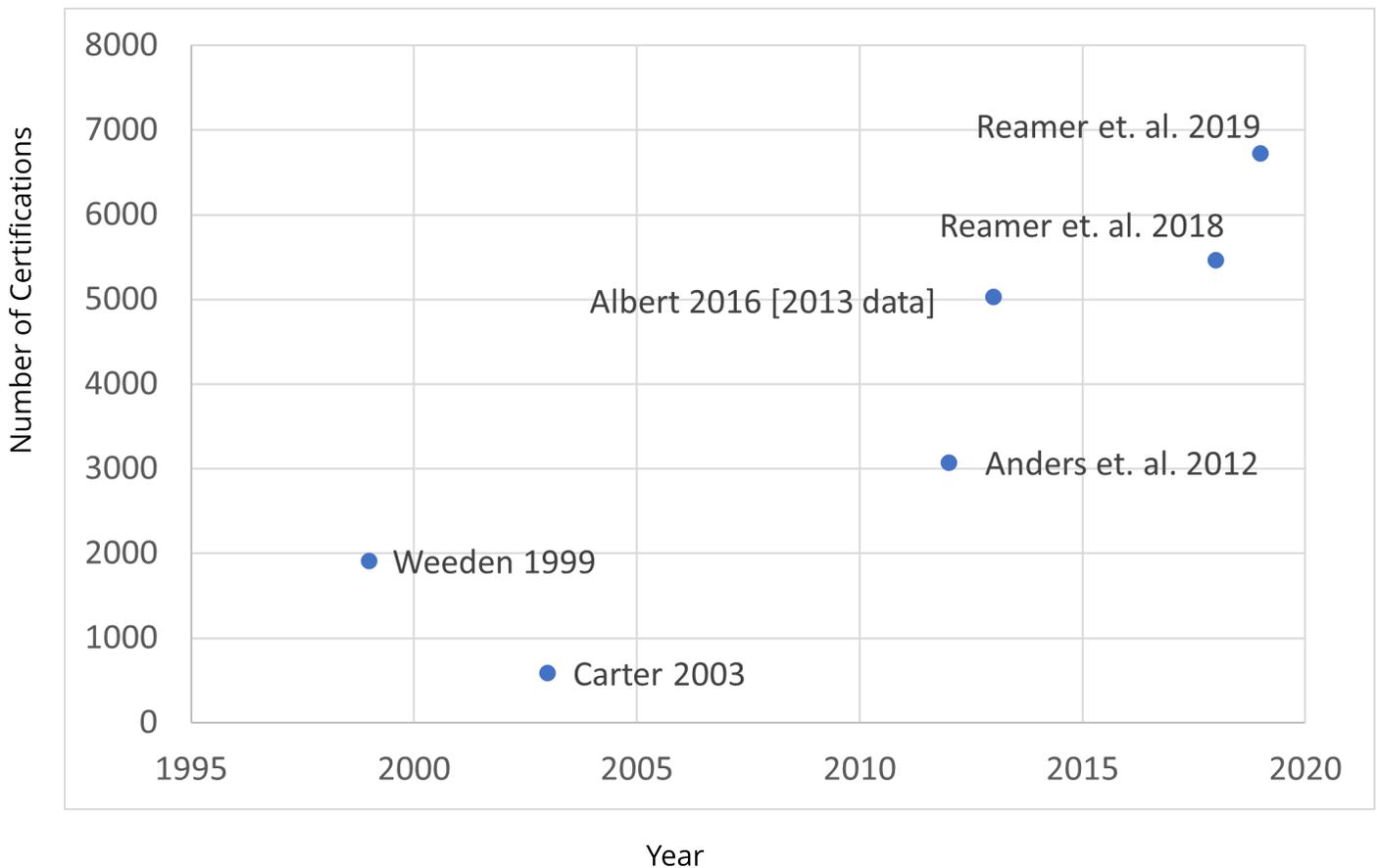
Local Contexts

Mary Walshok and John Skrentny's work at the UC San Diego Center for Research on the Regional Economy examines the role of university-based extension programs and finds that the choices made by individual research universities in creating new certificate programs matters for the overall development of regional labor markets in the technology sector. Likewise, Allison Forbes and her colleague at the Center for Regional Economic Competitiveness (and her collaborator, Henry Renski) are exploring the rea-

sons for differences in the wage premium associated with non- degree credentials (specifically certifications and licenses) in urban and rural areas, and across US states. New America takes a comparative approach across metropolitan areas in some of its recent work on apprenticeships, and Nichola Lowe's work on apprenticeship in Chicago similarly emphasizes local economic contexts.

Credentials as Regulation

A significant number of NCRN researchers examine the effects of non-degree credentials as potential barriers to employment and advancement in the labor market. Morris Kleiner's work offers a cautionary take on the potential for occupational licenses to limit opportunities for labor market entry, a caution that is shared to some degree by other NCRN members. Peter Blair continues to pursue research examining the implications of criminal background check requirements in occupational licensure and the potential for licensure to serve as a signal of non-felony status for minorities who hold it. Other members, including Kim Weeden, Stefan Stuth, Tingting Zhang and Bobby Chang, examine the implications of licensure for the structure of labor market opportunity and the productivity and service quality of credentialed workers.

The Impact of Non-Degree Credentials on Socioeconomic Inequality

NCRN researchers examine both differences between subpopulations in how workers benefit from non-degree credentials and how non-degree credentials affect the overall landscape of labor market inequality. Jeounghee Kim and her colleague Sangetta Chatteranj conducted a thorough analysis of the Survey of Income and Program Participation, and from this they concluded (in findings that mirrored work conducted by Lul Tesfai of New America using Adult Training and Education Survey data) that women benefit relatively less from certifications than male counterparts. In further work with the Current Population Survey, Kim and Chatteranj find that men without a bachelor's degree benefit significantly more from certifications and licenses than individuals with baccalaureate and advanced degrees. Tamar Jacoby's research on certification argues that certifications can potentially help disadvantaged individuals advance in the labor market, given the lower costs involved in earning many certifications relative to a college degree. Such research speaks to a fundamental question surrounding non-degree credentials (and certification in particular): namely, whether non-degree credentials are more available, and more valuable, for those with a college degree than those without.

Moreover, NCRN researchers recognize that the valuation employers assign to credentials affects their value in the labor market.In this vein, David Bills conducts research on how technology is transforming employers' hiring practices, including the potential benefits and peril associated with the growing adoption of algorithms. Sean Gallagher and his colleagues at Northeastern University's Center for the Future of Higher Education and Talent Strategy conduct survey research to assess employers' interest in and use of NDCs. Workcred is also continuing to focus on the role of credentials in hiring and promotion in the manufacturing sector.

New Pathways and the Unbundling of College Degrees

Some NCRN members focus on the potential for non-degree credentials to feed into or overlap with the curriculum of degree-granting institutions. Workcred is extremely ac-

tive in this regard, working with the Association of Public and Land-Grant Universities (represented in the NCRN by Shalin Jytoishi) and the Coalition of Urban Serving Universities to hold regular convenings that bring together representatives of higher education institutions and certification bodies to identify potential areas for future collaboration.Lauren Eyster and Martha Ross emphasize how career pathways can be shaped by organizations that serve as workforce intermediaries in specific occupations, industries, and regions in their research – a theme that also runs through some of the research conducted by New America and the Upjohn Institute on non-degree credential attainment. Dan Marschall likewise examines the potential for apprenticeship to benefit disadvantaged learners as well as the cultural norms that function as barriers to participation NDCs.

Some NCRN members are looking ahead to what the next generation of credentials – and mechanisms for storing and disseminating those credentials – may look like. For example, Martin Kurzweil's work with Southern New Hampshire University on new approaches to skills assessment for opportunity youth exemplifies the potential uses of technology to improve the identification of career pathways from the learner's perspective. In a similar vein, several NCRN members - including researchers based at GWIPP, Workcred, and the American Council on Education - are proposing and developing interoperable learner records that allow for the seamless integration of data on credentials attained in degree and non-degree contexts.

Credentials for Young Workers

Some of our members have an explicit focus in their work on young adults, including individuals who enroll in two- and four-year colleges directly after high school. Carrie Shandra and Lou Jacobson share a focus on how non-degree credentials fit into the educational and life paths of relatively young students.

Apprenticeship is a type of credential that is often studied specifically in the context of youth labor market transitions. Robert Lerman and multiple researchers at New America focus on the potential for apprenticeship to be especially beneficial for young workers. Researchers affiliated with Harvard's Managing the Future of Work program also highlight the potential for apprenticeship to help employers overcome skill shortages. Such research suggests that the apprenticeship model could expand into new occupations and industries. This research on apprenticeship complements research being done on other forms of work-based learning, such as internships and cooperative education – topics in which NCRN members such as Carrie Shandra and Sean Gallagher possess considerable expertise.

LESSONS LEARNED IN THE NCRN'S FIRST TWO YEARS

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The NCRN has provided a forum for the research and stakeholder communities to interact and identify the most pressing issues facing the field. Through discussions and presentations at our meetings, we have identified common obstacles facing the research community and discussed potential solutions to those issues. Below, we outline some of the challenges our researchers face and potential strategies for overcoming those challenges.

We still need a universally accepted taxonomy of credentials.

Even at meetings of the NCRN, some researchers repeatedly struggled to differentiate between certificates and certifications. While there are frequent references to a taxonomy chart published by Workcred, the existence of credentials that either do not narrowly fit into one category or another poses an ongoing challenge to researchers. The use of different classification systems in different studies can also pose a challenge to the generalizability of research, especially in the context of studies that attempt to differentiate between certificates and badges. Yet, we are making progress in the direction of common definitions and standards, thanks to the network's discussion of this issue.

The research community would benefit from both further work on a taxonomy of credentials for use in research and from greater understanding of the nuances of different types of credentials in the policy and other stakeholder communities with which we interact. Among stakeholders, certifications (credentials based on the demonstration of competency) and certificates (credentials based at least in part on the receipt of instruction) are among the types of credentials most prone to causing confusion.It is also problematic that few researchers and no federal surveys take into account the important differences among assessment-based certificates and certificates of attendance/completion, nor is there differentiation between for-credit and noncredit certificates. Differences between credit-based and non-credit certificates can also be missed in research using public datasets. Moreover, persistent

confusion exists regarding the differences between certificates and badges and whether the certificates of completion awarded upon completing an apprenticeship should be counted as certificates.

The scholarly research community needs high-impact dissemination outlets that are recognized by academic institutions.

With non-degree credentials falling outside the mainstream of the major academic disciplines, some NCRN members report a shortage of logical publishing outlets that provide the assurance of research quality and rigor that comes with blind peer review. Academic journals that focus specifically on occupational credentials, such as the *Journal of Vocational Education and Training*, *Studies in Continuing Education*, and the *Journal of Education and Work*, are not ranked by Journal Citation Reports – an essential arbiter of publication quality in the tenure and promotion processes of some academic institutions. This shortage of specialized outlets that "count" for the purposes of tenure-track hiring and promotion may partially explain why we do not see more interest in non- degree credentials research on the part of pre- tenure scholars in the United States. Moreover, review times at traditional academic journals (and the time investment in preparing manuscripts for journals) can reduce the timeliness of published research.

Efforts to create more peer-reviewed intellectual spaces for the dissemination of non-degree research may benefit existing scholars in this area, help to attract new researchers to this space, and improve overall standards of rigor in the research produced by the non-degree research community. However, these benefits would have to be weighed against the costs and risks of creating such a journal and alternatives, such as working to convince existing outlets for higher education scholarship to feature non-degree research more prominently. Any attempt to launch a new journal or increase the representation of NDCs in existing scholarly outlets would have to accommodate the highly interdisciplinary nature of NDC research, which attracts scholars from both disciplinary fields (e.g., sociology, economics) and applied ones like education and public policy. The interdisciplinary nature of the field has likely hindered the development of journals and conferences in the past, but also enriches the NCRN's collective methodological and theoretical range.

Stakeholders want to talk to researchers. Researchers are curious about what stakeholders have to say.

Another important lesson learned is that stakeholder organizations want to be involved in the NCRN and to have a voice in shaping the direction of research in this area. Interest in our stakeholder network has grown, with a contact list of stakeholder organizations growing from the approximately 30 stakeholders who attended our meeting in April 2019 to 99 stakeholders as of January 2021. Our stakeholders are also diverse, representing organizations that include regional workforce boards, state agencies, certification and licensure bodies, national membership associations, military credentialing professionals, legislators' offices, chambers of commerce and trade associations. Policymakers and public officials have been some of the most active stakeholders in the NCRN and in non-degree credentials research more broadly. Research on the qual-

ity and value of NDCs is particularly useful for state-level policymakers deciding whether and how to incorporate NDCs into their workforce development strategies, which in turn shapes the dynamics of the overall marketplace for credentials.

Initially, we were somewhat apprehensive about over-engaging with stakeholders out of a fear that stakeholders would not follow or care to contribute to discussions about research questions and methodologies, or that stakeholders would advocate for projects that benefit their own individual organizations but miss the "big picture" challenges facing the field. We have been pleasantly surprised that these fears seem to be unfounded; many stakeholder organizations are actively seeking partners for their own research projects. Stakeholders are also interested in collaborating with researchers to shape the federal government's data collection priorities with respect to non-degree attainment as federal policymakers develop the next generation of surveys and datasets. This interest led stakeholders to sign a shared comment letter in response to the proposed National Training, Education and Workforce Survey.

Projects aimed at improving the linkage of data on non-degree credential attainment to larger labor market datasets are promising.

Considerable enthusiasm exists within the network around projects that link data held by non-degree credential providers themselves with administrative records on employment and earnings outcomes. Such administrative data points are likely to come from state unemployment insurance wage records, many of which form the basis for state longitudinal data systems (SLDSs) or state longitudinal education databases (SLEDs). These data systems have the potential to unlock reams of valuable insights about the long-term effect of earning non-degree credentials if NDCs can be identified within these systems.

However, some researchers struggle to access administrative and survey data, even when such data is held by a public agency. Moreover, it will be necessary to overcome both privacy concerns and data quality issues (e.g., the absence of common identifiers like social security numbers) to successfully identify NDC holders in some of these datasets. Research by the National Skills Coalition indicated that progress is being made on this front, though it will be some time before even the largest national certification and certificate issuers fully integrate data on the credentials they issue with the majority of SLEDs. Similarly, the US Chamber of Commerce Foundation's efforts to synthesize the reams of "big data" created by employers through job postings and descriptions via the T3 Innovation Network and Job Data Exchange offer promising insights about the skills employers are seeking and which credentials may make individuals competitive for job vacancies. Workcred's initiative to link certification data to the National Student Clearinghouse database and the Manufacturing Institute's work with the Clearinghouse and Census Bureau also exemplify efforts to integrate credential attainment and earnings data to identify successful career pathways.

Employers remain a poorly understood actor in the credentialing marketplace.

While a few NCRN researchers focus explicitly on understanding the role of employers in the job market – most notably Professor David Bills – employers have been a reluctant participant in research and in some ways remain a missing link in our models of

the labor market value of non-degree credentials. Employers can naturally be expected to exercise a certain degree of caution in their engagement with the research community, given that many consider details of their recruitment and selection process to be proprietary in nature. NCRN members seem to be widely aware of anecdotal evidence concerning employers' practices, but a lack of engagement with employers limits our ability to understand the value proposition associated with non-degree credentials.

Efforts could also be made to encourage the collection of data on employers' attitudes and behaviors concerning hiring and credentialing on federal surveys. Precedence for such an effort exists in the United Kingdom, where the government-funded Workplace Employment Relations Study collects data from managers and corporate leaders about training and the hiring process. In this respect, most NCRN members would echo the call of the American Workforce Policy Advisory Board for more and better surveys of private firms to capture needed data on employer-provided training (U.S. Department of Commerce 2020).

Federal public-use data is helpful but insufficient to answer all research questions.

Public-use data sources may hold some of the answers to researchers' most pressing questions, and there are certainly examples of public-use files that have not been fully explored by the research community (e.g., the Employment and Training Administration's Participant Individual Record Layout files). However, the federal government is limited in what it can ask and how it can report data. Federal public-use datasets tend to be geographically aggregated at the state or regional level, limiting their usefulness for examining the effect of the local landscape of training providers on labor markets. Non-credit programs are a major blind spot in both sample-based (e.g., Current Population Survey) and administrative (e.g., IPEDS) data sources. And, the federal government has historically struggled to collect data that would indicate that one particular credential provider is superior to another in terms of labor market value.

One contribution of the NCRN to the research community has been increasing member awareness of available data sources, especially to researchers based at far-flung universities who may be less aware of some pre-existing data sources than counterparts in the think tank and policy research community. State longitudinal data systems (SLDSs, sometimes also abbreviated as SLEDs) are proving to be a resource that are of interest to the NCRN community, but community members struggle to figure out how to access and use. Researcher interest in data from LinkedIn is particularly strong, yet LinkedIn has so far been reluctant to engage with members of our network. Others have reported success to varying degrees in obtaining data from firms with proprietary crowdsourced "big data" datasets such as Payscale and BurningGlass, but the fees often charged for access to such datasets remain prohibitive for many NCRN members. However, NCRN researchers using BuringGlass and EMSI data on job vacancies and the credentials associated with such vacancies (for instance, at the University of Virginia Biocomplexity Institute and Jobs for the Future) can attest to the opportunities that are unlocked when working with data sources outside the federal public-use data system.

Going forward, the research community may wish to pool resources, for example to launch a nationally representative study that covers many topics related to NDCs. In-

dependent researchers are better positioned than the federal government to ask questions that are of a sensitive nature (for example, related to individual perceptions of the value of specific credentials – a topic that federal datasets have avoided for political reasons) and produce detailed datasets that explore the relationship between credential attainment and dimensions of socioeconomic mobility. The national survey commissioned by the Strada Education Network and conducted by Gallup may be a model for the potential scope (and expense) involved in such a study. Assembling a set of researchers with a demonstrated interest in such work may help justify the expenses involved in such a project to a funder.

Few NCRN scholars are conducting comparative or international research.

The U.S. probably leads the world in the availability of pubic-use survey data on non-degree credentials. Certain European countries do have indicators of credential attainment in administrative data, though research is often not particularly visible to the global research community. The Eurostat Adult Education Study and German Socio-Economic Panel have indicators of non-degree credential attainment, but the definitions used in both studies do not facilitate comparisons with the definitions commonly used in the United States, which tend to follow the recommendations of the federal government's Interagency Working Group on Expanded Measures of Enrollment and Attainment. The lack of synchronization across global data sources is a clear barrier to comparative research in our field.

Presently, where comparative research on non-degree credentials exists it tends to be descriptive in nature, limited to quantitative labor market research, or limited to apprenticeship. Understanding how different cultural and socioeconomic contexts relate to the selection and attainment of non-degree credentials and their labor market value could help us to identify policy solutions and best practices for implementation in the United States, and perhaps also explain why certain initiatives related to NDCs have had limited success in the American context. As discussed further in the section of this report focusing on unanswered research questions, comparative and international research could also help us to integrate non-degree credentials into international development programs. At present, we see very few linkages between NCRN members and researchers, development agencies, NGOs and educational institutions working in developing countries; though such work is not always supported by funders seeking to improve educational attainment in the United States, building such linkages is a logical future direction for our community. We have started to lay the groundwork for such collaboration by seeking an "AccelNet: Design" grant from the National Science Foundation to establish an international "network of networks" for non-degree credentialing researchers worldwide, and we hope to know whether our proposal will be funded in spring or summer 2021.

The NCRN's mission to improve collaboration and networking within the field is paying dividends.

We already know of collaborations that have started as a result of the NCRN's networking functions and discussions underway as a result of presentations at the NCRN meetings. One example of such a project influenced by the NCRN is a multi-institution

grant application to the Ontario (Canada) Ministry of Labour to study variation between Ontario universities in how they define certificates as a level of educational attainment, inspired in part by John Skrentny and Mary Walshok's work on university extension schools. Similarly, Lou Jacobson and Heather McKay have started to explore opportunities to collaborate on a state-level study of apprenticeship. Aside from direct collaboration, the informal ties between researchers being cultivated by the Network are widely cited in evaluations of the NCRN meetings as contributing to the cultivation of new research ideas.

The NCRN's efforts to promote networking and collaboration are also bringing public-sector stakeholders closer to the research community. NCRN members have been active in responding to Federal Register notices concerning federal surveys on NDCs, and in so doing are ensuring that NDCs are getting long-deserved attention from government researchers. The National Center for Science and Engineering Statistics (NCSES) prepared multiple briefings for NCRN members interested in the development of the National Training, Education, and Workforce Study, which is leading to a higher level of researcher input on the survey's questionnaire than would occur otherwise and should result in a public-use dataset that is responsive to the research community's needs.

Through an AccelNet: Design grant from the National Science Foundation, NCRN members could enjoy much greater engagement with international scholars over the next few years.

BIG UNANSWERED QUESTIONS

In the following pages, we identify some of the research questions that we as a research community may be exploring to varying degrees, but in which major efforts remain to be made to gain the insights we need to ensure that NDCs contribute effectively and equitably to the overall credentialing system in the United States.

Why are so many NDCs emerging?

This is a fundamental question, the answer to which may inform our approach to research addressing may other questions. Some research, both ongoing and predating the NCRN, has attempted to understand the motivations of educational institutions that launch NDCs, including the extent to which they use information about local labor markets to inform the decision to launch new certificate programs.

The extent to which business interests on the part of associations and institutions, to say nothing of the political pressures associations put on state licensure agencies, guide the creation of NDCs is largely unexplored in recent research. However, knowing the motivations of the issuers of credentials would surely impact our research on other aspects of credentialing. For example, evidence that a profit motive, rather than actual costs, guides the pricing of some certificates and certifications would point to the potential for non‑profit competitors to bring down prices and improve accessibility to lower-income learners. A better appreciation for the business aspects of credentialing would also help policymakers ensure that programs intended to encourage credential attainment do not lead to the accumulation of unnecessary or predatory credentials. Similarly, knowing the extent to which pressure to enact occupational closure impacts the design of certification programs may lead to greater attention to the necessity of the work experience requirements attached to many professional certifications. While the importance of closure in credential design has been explored at some length in sociological studies of "peak" professions and their associations such as law and medicine (e.g., Freidson 1986; Larson 1977), the origins of the attributes of credentialing programs outside these professions remains largely unexplored to this day. However, empirical observation that many certification and certificate programs are created on the initiative

of large corporations, employer organizations, and higher education institutions, suggests that the model of practitioner-driven professionalization described in much of the literature on professions may have limited generalizability.

Why do some learners (and not others) choose NDCs?

Despite a push for "college for all" on the part of some policymakers and advocacy organizations, many individuals who are fully qualified to excel in a degree program choose to pursue an NDC, either as a stepping stone to further education or as the postsecondary credential that launches their career. Some of these individuals do so in spite of ingrained cultural norms prizing the quality of instruction associated with a college degree (and, for some, the social experiences thought to accompany it). Different answers to the question of why individuals earn NDCs will exist in the context of different populations, such as youth and displaced workers, as well as different geographic and institutional contexts. The decision to pursue a NDC, a degree, or no credential at all is an intensely personal one, but such decisions do not occur in a vacuum, and researchers may be able to use knowledge about when and why credentials are pursued to design better credentials. Understanding the factors that lead learners toward or away from non-degree options may also help credential issuers redesign credentials to broaden their appeal. Such research may be particularly helpful to community-based organizations attempting to create credentials, including new certifications, that serve disadvantaged and displaced workers.

How do individuals choose between NDC fields and programs?

Arguably, field of study selection is underexplored at all levels of American higher education. Just as we know little about why some individuals choose non-degree credentials (especially among those who choose to pursue a NDC as an alternative to, rather than to complement, a college degree), we also know very little about how individuals go about comparing certificates, certifications, apprenticeships, and other NDCs. There are several sub-questions within this broad research question, all of which matter to researchers and policymakers who might view the promotion of NDCs as a means of alleviating socioeconomic inequality. One question is the extent to which individuals weigh potential future earnings as a factor in their choice of fields of study and NDC providers. While some state-level data on outcomes associated with various certificate and degree programs exists, we have few empirical data points about whether individuals are using such data, and to what extent data demonstrating strong economic returns to a credential is weighed against such personal decision-making factors such as preferences for different types of work environments, interests, and perceptions of how friendly a given field of study may be to individuals of a particular racial or gender identity.Another piece of this broad research question involves the potential role of advisors in the context of postsecondary non-degree education: to what extent do learners have access to and rely on advisors, what is the quality of advice that is available, and how does the use of advising relate to learning and career outcomes?

Who starts, but does not complete, programs leading to NDCs?

The extent of the virgin ground for researchers to explore here is difficult to understate. An indicator of the lack of attention given to persistence in non-degree programs comes from the award data published by the National Science Foundation. A keyword search for "persistence," the keyword often used in studies predicting the risk of dropping out of an academic program, reveals that on the first page of results alone the NSF has given $8,258,942 to support research and practice-oriented projects aimed at keeping students enrolled in college degrees. To our knowledge, the NSF has not funded a single study focused specifically on persistence in the non-degree context. In theory, higher completion rates facilitated by more flexible curricular requirements could be one of the major advantages of non-degree credentials over traditional degrees. However, the lower "sunk costs" in terms of tuition and time invested in some NDCs may also make them easier to walk away from. Knowing more about completion rates (and how those rates vary across subpopulations, types of NDCs, time to complete, and industries/occupations) would give us important data points to consider when determining whether to recommend NDCs to credential seekers.

What are the implications of NDCs for equity in the labor market?

Non-degree credentials are often thought to potentially mitigate labor market inequality by providing an alternative route to human capital accumulation and a signal of competence that employers should, in theory, reward with higher-quality employment opportunities. However, empirical research to date does not tell us whether, on net, non-degree credentials are reducing inequality. Prior research (e.g., Albert 2016) finds that individuals who already hold a college degree are more likely to obtain certain types of NDCs than those without a degree, suggesting that NDCs can help individuals who already possess advantages in the labor market to further distinguish themselves. But what about the effect of earning a NDC for subpopulations – in terms of race, gender, or other demographic attributes – that have historically faced labor market disadvantage?

While some certifications certainly offer a pathway to career advancement for individuals without a college degree, we need to know more about how often, and to what extent, such benefits accrue to individuals who seek a credential as an alternative to or a substitute for a college degree, and whether those benefits accrue unequally across workers of different races and genders. We also need data on whether certain non-degree credentials, such as those commonly earned for entry-level positions in the health sciences, tend to be associated with lower levels of upward economic mobility as individuals become "tracked" into lower-paying occupations. While NDCs can certainly be better than no credential at all for many workers, much more research is needed to be able to make inferences about how outcomes associated with NDCs compare to degrees and the implications of the growth of NDCs for overall levels of inequality.

What barriers exist to the attainment of NDCs?

The direct costs associated with non-degree credential attainment, such as tuition and required course materials, are rarely measured in any systematic manner. While it is widely believed that certifications are far cheaper than degrees, we do not know to what extent this cost difference results in a lower net burden to potential certificants – especially considering that options for federal, institutional, and employer-based financial assistance for NDCs are very different from those that are available to degree-seeking students.NDCs at the high end of the cost spectrum, such as coding boot-camps, are increasingly offering financing through private lenders at interest rates and other terms that differ from loans guaranteed by the US Department of Education to fund accredited degrees, including income sharing arrangements; in a similar vein, merit and need-based aid that directly subsidizes tuition and fees is less common for non-credit, non-degree programs than degrees. Understanding the extent of financial barriers to attainment would help actors in this space design and promote credentials that are less burdensome to potential learners.

Cost is not the only barrier worthy of researchers' attention. We also know relatively little about how academic preparation, time constraints, and pre-existing knowledge and perceptions about NDCs may pose barriers to the attainment of non-degree credentials.To answer these questions, we may need to collect data on the characteristics of individuals who do not pursue non-degree credentials for the purpose of establishing a control group that can be compared to those who do attempt and attain NDCs.

How do we differentiate between high and low quality NDCs?

While NCRN member organizations, including Workcred, the Rutgers Education and Employment Research Center, and the National Skills Coalition, conduct extensive research around issues of quality – including how to define quality in the context of non-degree credentials – researchers still struggle to accurately categorize NDCs on the basis of quality. Accreditation standards for certification are largely based on the processes used by a certification body to assure the integrity of its examinations and the validity of competencies measured, and are not a reliable indicator of the labor market value of a certification. Due to the proprietary nature of certification and licensure examinations, it is difficult for outside researchers to characterize the rigor of a given credential unless a credential is accredited by a third party based on publicly accessible standards. Quality assurance indicators are even more scarce for NDCs other than certification and licensure (and perhaps apprenticeship programs registered with the US Department of Labor), though new entities are emerging to evaluate the quality of certificate programs. Similarly, data on pass rates are often treated as a trade secret – and even if known, could be contingent on the relative level of preparation of individuals choosing to sit for certification exams. Thus, there is a need for innovative research methods that allow researchers to identify the relative rigor and quality of a NDC, which could enable research comparing accredited and non-accredited NDCs.

What is the value of non-credentialed training and learning experiences?

Job seekers and other individuals are free to list educational experiences on their re-sumes and job applications that do not correspond with a credential of any type. Also, many individuals have gained extensive human capital through activities that are not assessed through formal certification exams or documented on transcripts. Such skills and competencies can come through years of on-the-job experience, or even through reading books and self-study outside of a formal learning environment. A growing number of entities are developing ways to measure these competencies, but much work remains to be done. In a future labor market where employers are truly able to hire based on competency, we can imagine that employers would rely as much on the demonstration of competencies gained outside of formal credentialing programs as ones gained inside them. Identifying the extent to which employers would actually value such competency – and the barriers to the acceptance of such evidence of competency – is an essential question to be answered as policymakers call for the creation of interoperable learner records (a.k.a. "learning and work records") that unite learning from many formal and informal contexts.

What types of certificates are of greatest value to different subpopulations of learners?

Among the large categories of NDCs commonly recognized within the NCRN and in the credentialing research community, certificates are probably the category that remains most amorphous and daunting to researchers. Certificates take many different forms and are offered at many different levels by many different types of institutions – and range in duration from one day to over a year. Nearly all types of accredited higher ed-ucation institutions offer certificates, but the nature of a certificate issued by a com-munity college may vary dramatically from one issued by a private liberal arts college or a research university. Some, but not all, university-based certificates are intended to be completed by individuals who hold a bachelors' degree, yet some of those post-baccalaureate certificates are considered non-credit and do not result in credits trans-ferrable to a master's degree. Likewise, certificates offered by different types of voca-tional and trade schools vary dramatically in the extent and quality of their assess-ments, which can limit efforts to embed such credentials into degrees. Moreover, full-time, short-duration programs in information technology that describe themselves as "bootcamps" are sometimes analyzed as a unique class of credentials, yet most datasets are not fine-grained enough to pick out bootcamp completers from other certificate-holders (if survey respondents even manage to identify bootcamp creden-tials as certificates).

Clearly, certificates are a heterogeneous category of credentials. We have a two-part problem when examining certificates: the first part being disagreement on whether and how to differentiate between them in official datasets, and the second being a lack of quality data on the universe of certificates and certificate-holders – especially for those certificates based on courses that do not award academic credit and are not cov-ered in the Integrated Post-Secondary Education Data System (IPEDS). (Another issue, alluded to in a report by the American Institutes for Research [2013], is that survey re-spondents may not know the attributes of certificates and certifications that they

hold.)Innovative data collection methods and a widely accepted taxonomy of certificate programs that classifies certificates according to distinctions such as accredited vs. non-accredited, short vs. long-term, and credit vs. non-credit, may be needed for researchers to be able to guide individual learners toward the types of certificate programs that are most likely to result in positive labor market outcomes.

How do employers value NDCs relative to degrees?

Employers' attitudes toward, and the valuation they place on, various non-degree credentials is still poorly understood. With tens of thousands of certifications and certificates available in the United States alone (Reamer*et. al.*2019), employers may struggle to identify which credentials are of value and which are not. While several credible research studies of employer perceptions of credentials in specific industries and contexts have given us insights on this question, much remains to be learned about the situations under which employers may accept (or even prefer) a certification, apprenticeship or other NDC to a degree and how NDCs are valued in determining salary and promotion.

As employers ultimately determine the value of credentials in the hiring and promotion decisions they make, their perceptions of credentials are of vital importance for understanding the nature of the earnings premium attached to degree and non-degree credentials and why it may vary across different types of NDCs and even within specific types. NDCs may well be preferable to degrees in many contexts, for example in fields where hands-on apprenticeship training provides an assurance of competence that goes above and beyond what one learns in the classroom. Identifying such contexts would help policymakers justify investments in expanding access to those credentials.

What are the non-wage benefits of NDC attainment?

The theory that non-degree credentials pay off for workers in ways that do not increase wages (or very indirectly increase wages) has been explored in studies of nursing certifications, but by in large has not attracted the attention of the broader non-degree research community. Nursing scholars coined (and copyrighted) a common set of survey items known as the Perceived Value of Certification Tool decades ago (Sechrist and Berlin 2006), a questionnaire that focuses on a broad set of intrinsic and extrinsic benefits, including benefits that may only indirectly affect earnings such as being perceived as an expert among one's peers and the sense of accomplishment and professional identity that may accompany certification. These sorts of benefits have been investigated to a far more limited extent in other types of non-degree credentials, including licenses, certificates, and apprenticeships, though data on the relationship between credential attainment and some aspects of job quality and satisfaction for some segments of the population may be available through surveys sponsored by the National Center for Science and Engineering Statistics. Moreover, broad benefits to society would be associated with having a workforce in which skills and competencies are upgraded as a result of attaining non-degree credentials, especially in fields where public health or safety is affected by the competency of individual practitioners. Documenting the existence of such benefits – and comparing the extent of such benefits in non-degree credentials relative to college degrees and non-credentialed skill acquisi-

tion – would help us understand the overall value proposition inherent in expanding access to non-degree credentials.

How do the long-term outcomes associated with online NDCs compare to high-contact NDCs?

Much of the research on online learning has focused on the effectiveness of online platforms for educational purposes – examining how online students learn, and to what extent online learners retain knowledge.However, few studies exist that compare the labor market outcomes associated with online degrees to in-person degrees, and the long-term consequences of choosing to complete a NDC through an online (or even a blended or hybrid course format) remains virgin ground for researchers. If we believe that some of the labor market value associated with the completion of credentials comes from the social and cultural capital acquired through in-person interactions with classmates and instructors, to say nothing of the qualitative experience of learning in an in-person format, we would expect online NDCs to be associated with weaker outcomes over time as their graduates find themselves with less of a professional network (and perhaps less intensive professional socialization) to fuel career advancement. This effect may be more pronounced for certain categories of workers, such as youth and workers from disadvantaged socioeconomic backgrounds. Establishing an evidence base on the implications of online non-degree instruction for labor market outcomes and socioeconomic mobility may enable institutions and policymakers to make better decisions about the design and character of these programs, especially now in the wake of the Covid-19 pandemic.

Are more intensive NDCs more valuable than shorter, less rigorous NDCs in the labor market?

Because much of the research on the labor market outcomes associated with non-degree credentials tends to treat attainment as a binary variable, we know little about whether the duration, intensity, or even the quality of instruction in non-degree programs (perhaps especially certificates) is related to the benefits that those who complete such credentials receive in the labor market. The extent to which employers are even aware of the nuances between different certifications and certificates in the duration and depth of associated learning experiences is unclear. While the quality of instruction in certificate programs is difficult to quantitatively measure, basic measures such as seat time, instructor qualifications, and assessment tools used to evaluate learning may exist that can be used as proxies for the intensity and rigor of instruction (and the quality of learning). Knowing how these quality measures relate to labor market outcomes would allow for much more effective career advising in cases where an individual is choosing between shorter or longer NDCs.

How effective is the public workforce system in supporting the attainment of quality NDCs?

The system of public assistance for job seekers established under the Workforce Innovation Act and continued under the Workforce innovation and Opportunity Act (WIOA) includes mechanisms intended to connect displaced job seekers with quality credentials, often favoring non-degree credentials that can be completed faster than college

degrees. The primary mechanism for ensuring that individuals choose quality credentials when receiving grant support under WIOA through Individual Training Accounts are the eligible training provider lists (ETPLs) established by each state. ETPLs, which are intended to shape the structure of incentives for displaced workers and help individuals seeking training to identify quality credentials in high-demand fields, are gaining attention from policymakers and researchers alike as recognition grows of their role in shaping the structure of training and credentialing opportunities for displaced and disadvantaged workers. However, much is still unknown about their effectiveness –and of the overall effectiveness of public support for retraining and credentialing. More broadly, we know little about why some unemployed individuals seek non-degree credentials, and how they go about choosing from among the thousands of non-degree credentials available to American workers. Research that helps us understand variation in credential attainment on the part of unemployed workers (and other disadvantaged individuals served under WIOA) could help us design credentials and innovations that improve outcomes for individuals transitioning between employers and careers.

Would innovative credentials gaining traction in the United States be of value in the context of developing countries?

For its first two years, the NCRN has focused primarily on non-degree credentials in an American context, though several European experts were invited to join our initial meeting in April 2020. However, some types of non-degree credentials are available throughout the world. Professional certifications, in particular, tend to be available globally; indeed, US-based certification organizations are even largely exempt from US economic sanctions and free to offer their credentials in otherwise restricted markets like Iran and Cuba. Similarly, certificates based on massively open online courses are widely available in developing countries. Yet, we know little about how NDCs are being used in an international context.

Development agencies such as USAID spend substantial sums of money on programs to enhance human capital in developing countries, but the extent to which such programs incorporate non-degree credentials varies widely.There is an opportunity for the non-degree research community to engage with institutions in developing countries to enhance the quality of non-degree credentials worldwide, which may include disseminating emerging models and best practices in the United States to educators, regulators, and learners worldwide. Such outreach could also help our community to identify best practices that could be applied in a US context to contribute to the skills and competencies of our workforce.

CONCLUSION

How do non-degree credentials – and credentialing research - fit into the challenges facing policymakers and the future workforce?

Learning more about non-degree credentials not only helps us assess their usefulness in meeting credential attainment goals (such as Lumina's 2025 attainment goal) but is also useful for understanding how the workforce can prosper in the face of technological change and other social trends, such as globalization and economic stratification. What started over two decades ago with self-checkout machines at supermarkets and automated teller machines is accelerating; retail jobs are being lost to e-commerce and only being partially replaced by the network of distribution warehouses emerging on the outskirts of American cities.Displacement from service-oriented jobs in retail and hospitality sectors accelerated in the wake of the COVID-19 pandemic, but changes in the distribution of employment opportunities across industries have been a constant feature of the American labor market. Non-degree credentials have the potential to speed up the reskilling process as individuals move between occupations and keep up with technological developments within their fields. Researchers should be mindful of the potential for economic mobility unlocked by such reskilling and upskilling to indirectly benefit society by ameliorating some of the consequences of poverty, such as high rates of opioid abuse and the entrenchment of polarizing political ideologies.

More broadly, addressing these grand challenges – especially the consequences of growing socioeconomic inequality – require the research community to move beyond the demonstration of value. There is a need for the research community to not just collect evidence, and rather build a case for the effectiveness of quality NDCs as facilitators of mobility. We must actively propose and evaluate different policy options for increasing the attainment of quality NDCs. Proposals currently circulating in the policy advocacy and think tank communities concerning the expansion of apprenticeship, new modes of federal support for financing NDCs, and efforts to improve the creation of new credentials and training programs deserve urgent attention from the research community. One potential initiative worthy of specific mention is the expansion of Pell grant eligibility for short-term training and credentials, such as certificate pro-

grams. Knowing more about the return-on-investment associated with short-term certificates would help us understand whether expanded eligibility for such programs would be likely to unlock economic mobility for a broader population of learners. Similarly, the potential of the industry-recognized apprenticeship program (IRAP) model promoted under the Trump administration should be critically evaluated by researchers. Do IRAPs help expand the availability of experiential learning to learners who would otherwise be excluded from traditional apprenticeship, certificate, or certification programs, and if so does that availability compensate for such programs' abbreviated nature?Having a more robust literature to draw upon on the attributes of apprenticeships that correlate with earnings premia would help us to answer this sort of question.

As NDCs remain in the policy spotlight in the wake of the COVID-19 pandemic and continue to be prioritized by politicians and policymakers looking to quickly re-employ individuals displaced by the recession, it is essential for the research community to keep its eye on how NDCs fit into a long-term vision for a more efficient and equitable labor market. Addressing the pressing needs for research to inform policy decisions in the present while keeping an eye on how NDCs may interplay with long-term social trends is a tall order for our research community, yet the growing size and intellectual capacity demonstrated in the first two years of the NCRN suggest that we can rise to the challenge.Going forward, the NCRN can take inspiration from the biological sciences in its approach to research. As famously observed by Platt (1964), better organized scientific disciplines – those with stronger professional networks and infrastructure, and consensus on a unified research agenda – tend to make more progress over time. The objectives identified in this report, which are subject to change over time as the NCRN engages in further dialogue on the state of the field, could give non-degree credentialing researchers the sort of guidance and cohesion (as well as access to data from public and private-sector stakeholders) that leads to breakthrough discoveries. It will ultimately be up to the many researchers and stakeholders in this space to decide whether we work in tandem and advance as a field, but the roadmap provided in this document offers a clearly defined starting point to work from for researchers answering the call to improve our credentialing system.

REFERENCES

Albert, Kyle. 2016. *Why Certify? Examining the Consequences of Occupational Certification for Individuals and Professional Associations.* Ph.D. dissertation, Cornell University.

Anders, Kathleen, Duncan Bell, Madiha Waris Qureshi, and David Epstein (Eds.). 2012. *National Trade and Professional Associations of the United States 2012.* Washington, DC: Columbia Books.

American Institutes for Research. 2013. "Cognitive Interview Findings for Items to Measure Certifications, Licenses, and Educational Certificates among Adults in the United States." Washington, DC: American Institutes for Research.

Carter, Shani D. 2005. "The Growth of Supply and Demand of Occupational-Based Training and Certification in the United States, 1990-2003." *Human Resource Development Quarterly* 16(1): 33-54.

Cronen, Stephanie, Meghan McQuiggan, and Emily Isenberg. 2017. *Adult Training and Education: Results from the National Household Education Surveys Program of 2016 – First Look.* Washington, DC: American Institutes for Research.

Freidson, Eliot. 1986. *Professional Powers: A Study of the Institutionalization of Formal Knowledge.* Chicago: University of Chicago Press.

Larson, Magali S. 1977.*The Rise of Professionalism: A Sociological Analysis*. Berkeley, CA: University of California Press.

Platt, John R. 1964. "Strong Inference." *Science* 146 (3642): 347-353.

Reamer, Andrew, Lee Winkler, Allison Forbes, Danielle Gilmore, Amanda Holmes, Jeff Grann and Mark Trappe. 2018. *Counting U.S. Postsecondary and Secondary Credentials. Washington*, DC: Credential Engine.

Sechrist, Karern R. and Linda Berlin. 2006. "Psychometric Analysis of the Perceived Value of Certification Tool." *Journal of Professional Nursing* 22(4): 248-252.

U.S. Department of Commerce. 2020. "The American Workforce Policy Advisory Board: Call to Action" Washington, DC: Department of Commerce.

Weeden, Kim A. 1999. *From Borders to Barriers: Strategies of Occupational Closure and the Structure of Occupational Rewards*. Ph.D. dissertation, Stanford University.

APPENDICES

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- Isabel Cardenas-Navia, Workcred
- Karen Elzey, Workcred
- Roy Swift, Workcred

Represented Stakeholder Organizations

The following organizations were represented in the NCRN's stakeholder list as of February 2021. However, word of our webinar series has traveled widely and representatives of many other organizations have participated in our webinars on an ad-hoc basis.

- 2U, Inc.
- Accenture
- American Association of Community Colleges
- American Association of Retired Persons
- American Enterprise Institute
- Apple, Inc.
- Ascendium Education - Philanthropy Division
- Association for Career and Technical Education
- Association of Public and Land-Grant Universities
- Auburn University
- Calbright College
- Central Georgia Technical College
- Community College of Rhode Island
- Competency and Credentialing Institute
- Concentric Sky
- Coppin State University
- Council for Adult and Experiential Learning
- Council for Higher Education Accreditation
- Council of Graduate Schools
- Credential Engine
- Credly
- Digital Marketing Institute
- Dream2Career
- Education Commission of the States
- Education Strategy Group
- General Assembly
- Greater Washington Partnership
- H-CAP
- Indiana Commission on Higher Education
- Institute for the Future
- Inteleos
- International Brotherhood of Teamsters
- Jobs for the Future
- LinkedIn
- Maher & Maher
- Maricopa College
- Markle Foundation
- Massachusetts Institute of Technology
- Miami-Dade College
- National Association of Manufacturers
- National Center for Higher Education Management Systems
- National Coalition of Certification

Centers
- National Council of State Boards of Nursing
- National Governors Association
- National Science Foundation
- National Skills Coalition
- National Student Clearinghouse
- New Jersey Community College System
- New Jersey Department of Labor
- New School University
- Parchment
- Professional Testing, Inc.
- Skills DMO
- SmithBucklin / Institute for Credentialing Excellence
- Solutions for Information Design
- State of Florida
- State of Kentucky
- State of Texas
- StrategicED
- The Conference Board
- U.S. Census Bureau
- U.S. Chamber of Commerce Foundation
- U.S. Department of Commerce
- U.S. Department of Labor
- U.S. Senate
- UNESCO
- University Professional and Continuing Education Association
- University of Maine
- University of North Carolina
- Washington State Workforce Training Board
- Western Interstate Commission on Higher Education
- Working Nation

Table of Webinar Speakers and Topics

Date	Speakers	Topic
November 5, 2019	Michelle Van Noy Amy Ellen Duke-Benfield	Quality in Non-Degree Credentialing
March 10, 2020	Denise Roosendaal Kevin Bradley	ICE Value of Certification Study
May 18, 2020	Sean Gallagher	Community Colleges and NDCs
June 2, 2020	John Finamore	National Training, Education and Workforce Survey
June 17, 2020	Stuart Andreason Iris Palmer Paul Osterman Holly Zanville	Virtual Plenary on COVID-19
July 1, 2020	Stuart Andreason Iris Palmer Steven Partridge Kenyatta Lovett	NDCs and Employment Issues in the Wake of COVID-19
July 22, 2020	Gardner Carrick Vanessa Brown	Linking Administrative Records to Analyze
August 5, 2020	Nan Travers Kent Phillipe Cindy Cisneros	Incremental Credentialing and the "Credential as You Go" Project
August 25, 2020	Heather McKay Anna Galas Lisa Ferris-McCann	The Interstate Passport and Recognition of Transfer Credit
September 23, 2020	n/a	NCRN General Meeting
October 21, 2020	Lauryn Eyster Molly Scott Charla Long	Competencies in Higher Education
November 11, 2020	Katherine McClelland David Soo Jane Oates Carl Van Horn	The 2020 Election and Future of Workforce Policy
November 24, 2020	Louis Soares Jonathan Finkelstein	Badges and the Future of Credentialing
January 27, 2021	n/a	NCRN General Meeting
February 18, 2021	Todd Greene	Introduction to WorkRise
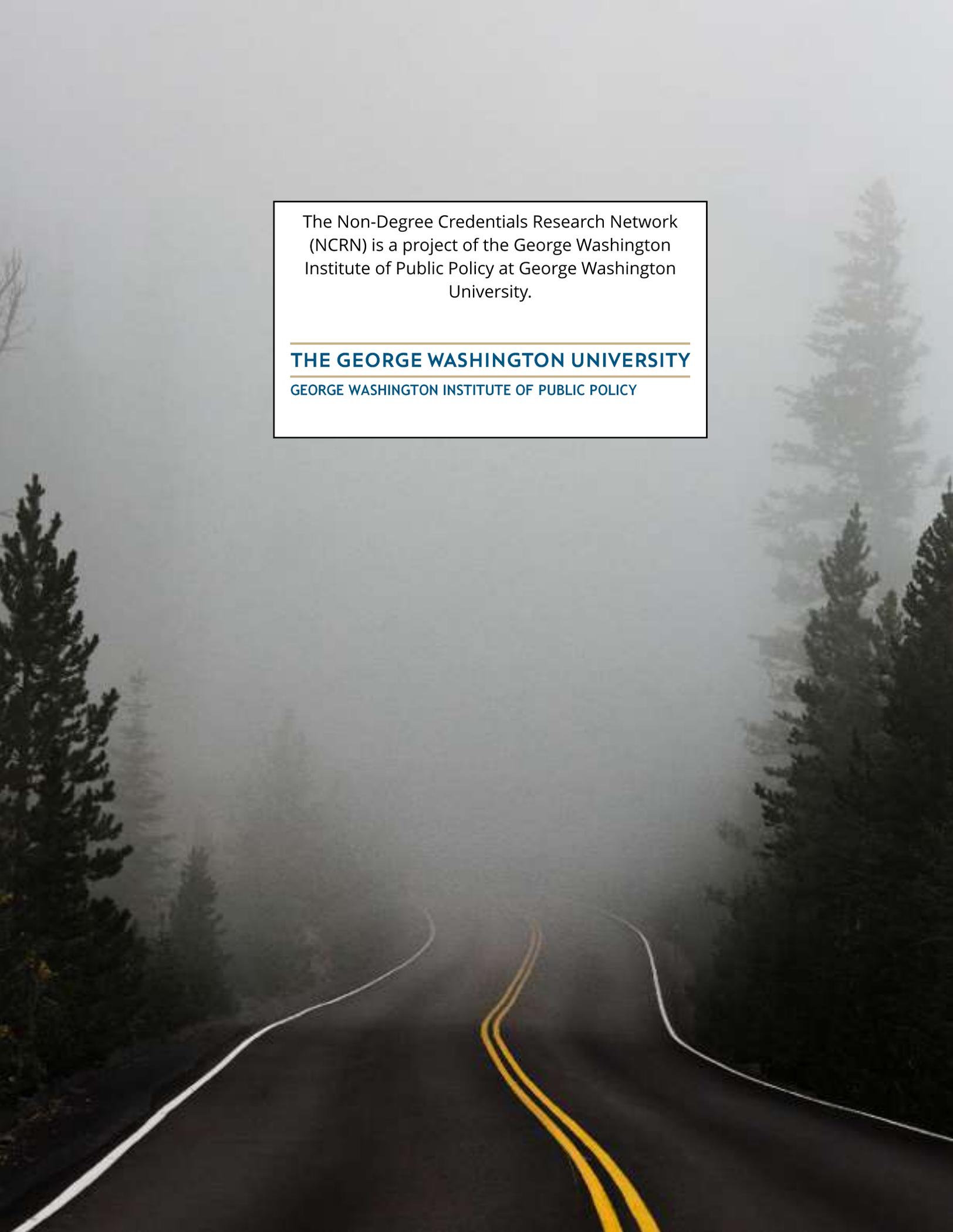
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