EVALUATION REPORT

Moving Systemic Reform across 12 States to Implement Nationally Portable, Industry-Recognized Credentials in Advanced Manufacturing

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EVALUATION CONDUCTED BY:
Kennedy Consulting LLC
The Manufacturing Institute is the non-profit, non-partisan affiliate of the National Association of Manufacturers (NAM). The Institute is the authority on the attraction, qualification, and development of world-class manufacturing talent in the United States.

To fulfill this mission, the Institute designs and implements human capital strategies that respond to the needs of working learners, positioning workers for careers in advanced manufacturing.

The NAM-Endorsed Manufacturing Skills Certification System (SCS) is the flagship education initiative of the manufacturing sector, integrating nationally portable, industry-recognized credentials to high school, community college, and university programs of study. For more information, please visit The Manufacturing Institute at: www.themanufacturinginstitute.org

Lumina Foundation, an Indianapolis-based private foundation, is committed to enrolling and graduating more students from college—especially 21st century students: low-income students, students of color, first-generation students, and adult learners.

Lumina’s goal is to increase the percentage of Americans who hold high-quality degrees and credentials to 60 percent by 2025. Lumina pursues this goal in three ways: by identifying and supporting effective practice, through public policy advocacy, and by using our communications and convening power to build public will for change. For more information, visit www.luminafoundation.org
EXECUTIVE SUMMARY

Description of the Project

Lumina Foundation provided a generous four-year grant, from 2010 to 2014, to help advance a national model, aligning educational pathways with career pathways into a cohesive system of stackable and portable credentials, beneficial to workers and employers alike. This project, initiated by The Manufacturing Institute, uses the NAM-Endorsed Manufacturing Skills Certification and aims to dovetail industry-recognized credentials in advanced manufacturing with (primarily) postsecondary education programs of study.

This important initiative is part of the nation’s mandate to drastically increase the percentage of Americans with high-quality degrees and credentials, and to prepare half a million workers for cutting-edge manufacturing jobs, many of which currently go unfilled due to a shortage of skilled, credentialed workers. This project has been entitled, “Moving Systemic Reform Across 12 States to Implement Nationally Portable, Industry-Recognized Credentials in Advanced Manufacturing Educational Pathways.” The project is strongly aligned with Lumina Foundation’s Big Goal to increase the proportion of Americans with high-quality degrees, certificates and other credentials to 60 percent by the year 2025.

This project built off of earlier pilot projects that proved the worth of industry certification and the alignment of certifications to academic programs of study. In 2009, the Institute launched a project, funded by the Bill & Melinda Gates Foundation, to implement the NAM-Endorsed Skills Certification System in four community colleges: Forsyth Technical Community College (North Carolina), Lorain County Community College (Ohio), Alamo Colleges (Texas), and Shoreline Community College (Washington). Through that project, the Institute developed multiple models for aligning certifications to programs of study. It also forged model articulation agreements among high school career academies, two-year institutions, and four-year institutions and demonstrated the power of industry certification and stackable credentials as a means to meet employer demand.

Through a separate grant from Lumina Foundation, in 2010 the Institute expanded the NAM-Endorsed Skills Certification System to Indiana. Working with employer groups and building a deep partnership with the Ivy Tech Community Colleges, the Institute demonstrated the ability to take skills certification to scale statewide. The Ivy Tech system successfully integrated the NAM-Endorsed Skills Certification System in multiple disciplines and aligned curriculum, thereby giving employers and students in Indiana greater certainty about the quality and uniformity of technical education across the state. We have included some of the successes and findings from this closely related grant as informing this evaluation.
The path was set for still broader implementation as envisioned in the 12-state grant from Lumina Foundation for Education. The crux of this grant was identifying a “lever of change” in each state—in most cases an employer association—that would generate awareness of skills certification and build a consensus for system-wide implementation.

**Key activities included:**

- Convening state leadership teams
- Using labor market information to determine high-demand manufacturing competencies
- Working with early adopter colleges to align to industry certifications
- Providing technical assistance to community colleges in certification and curriculum reviews, gap analysis, and pathway alignments
Overall Execution of the Project:
A Case Study in Scalability and Leveraged Resources

The grant envisioned a slow rollout in preparing states for implementation and building employer-driven action plans. As the grant got underway, however, it was clear that stakeholders in every state were ready to act immediately, starting in the first year. Therefore, the Institute accelerated activities and achieved scale much faster than anticipated.

Instead of working slowly through each state, every state identified early adopter colleges and had a range of successes, including state policy changes as well as wider adoption of certifications within the education system. In fact, activities spread past the 12 funded states as the NAM-Endorsed Skills Certification System gained momentum; at present more than 120 community colleges in 36 states offer certifications embedded in programs of study or are in the process of aligning to the certifications.

Two major factors were pivotal in the exponential growth of the Skills Certification System. The first occurred on June 8, 2011, when President Obama highlighted the NAM-Endorsed Manufacturing Skills Certification System as a key step towards building the educated and skilled workforce U.S. manufacturers need to successfully compete in the 21st century economy. The President cited the goal to credential 500,000 students with nationally portable, industry-recognized certifications to join the manufacturing workforce by 2016.

The second catalyst has been the Trade Adjustment Assistance Community College and Career Training (TAACCCT) initiative, a grant initiative of the U.S. Department of Labor to build capacity in community colleges for the development and expansion of innovative training programs aligned to industry certifications. In round 2 of the TAACCCT grants, $175 million of the $500 million available nationally were awarded to advanced manufacturing projects. Most significantly, consortia in several states that had organized through the Lumina-funded grant successfully competed for TAACCCT grants, which are now in operation. These awards magnified the impact of the Lumina grant many times over. They also aligned entire states and college systems behind the NAM-Endorsed Skills Certification System and continued the acceleration of employer-driven solutions for advanced manufacturing education.
Approach to the Evaluation

The purpose of the evaluation is to quantify the value of the Lumina grant activities to educators and employers, and to recommend improvements to the process flow that can be incorporated into future project activities as skills certification efforts grow nationwide. The evaluation tracked the progress of the 12 states involved in the project: Alabama, Arkansas, Connecticut, Florida, Illinois, Iowa, Kansas, Mississippi, Nevada, New York, Tennessee, and Wisconsin.

The evaluation approach consisted of two primary components:

1) qualitative analysis through one-on-one interviews with Manufacturing Institute leaders and primary project stakeholders in the 12 states (with separate questionnaires for business and education), and

2) an analysis of documentation of project activities and supporting materials.
Findings

1. **The effort changed the conversation about the importance and value of nationally portable, industry-recognized credentials and helped galvanize and support systemic change in some states.** The conversation about manufacturing certification on the national level changed in a very short period of time, bringing attention to the validity of industry credentials and opening the door to discussions about policy barriers.

2. **The state-level leadership convening activities supported by the Lumina grant resulted in unprecedented partnerships and collaboration, and served as a genesis for building a vision and strategy that states could implement.** A new level of awareness among all stakeholders has been established regarding industry/employer needs and how the education system must do things differently.

3. **Lumina funds served as an important building block in mobilizing states to successfully pursue continued funding.** The Foundation’s name, reputation, and the initial grant funds received by each state opened doors and gave credibility to what states were doing and facilitated the development of successful proposal for grants from the federal government and private foundations.
4. **While the most successful efforts were galvanized and led by business associations, engaging employers and sustaining their involvement can be challenging.** Reasons for employer skepticism varied from state to state, but many employers across the country have a hard time seeing and understanding the credentialing system’s value unless they hear it from another employer.

5. **Even with increasing national and state momentum to adopt industry credentialing as a significant education reform strategy, there is still resistance to change among community colleges.** The most effective implementations involved community college executive leadership as well as measures, such as peer learning and listening sessions, that gained buy-in from deans and faculty.

6. **More work is needed to promote general awareness and understanding of skills certifications and their importance as an education reform strategy.** The ability to spread awareness through a statewide campaign -- for everyone to hear the same message at the same time -- was critical to launching and sustaining their efforts.

7. **The number of certifications has increased substantially.** The message is being heard, and states are beginning to see the fruits of their labor.

8. **Most of the states were starting from scratch, but were able to galvanize their efforts to gain traction more quickly by organizing around a “lever of change.”** There is no “one size that fits all.” Each of the states was at a different place on the pathway, and the Institute has been able to provide a systematic structure to certification, while also allowing states some flexibility in their approach.

9. **Nearly all states were able to develop scalable models but many have found it challenging to take them to scale statewide.** Overcoming the barriers presented by independent structure of most community college systems and the autonomy of many state agencies and local governing bodies is critical in driving statewide reform.

10. **There has been genuine excitement about the project its objectives across a wide range of stakeholders.** When the Institute reached out to each state to prioritize which would be first to implementation, every state stepped up and asked to begin in year one.
Lessons Learned

1. **The effort has to be employer-driven.**
   Without the backing of industry and manufacturing employers in particular, the effort is likely to fail. States should involve business early, listen to what they say, and provide a tangible, meaningful part to play in planning and implementation.

2. **Select a state champion to drive the change.**
   The champion needs to come in the form of an individual (generally from within industry, or possibly government) and also in the form of a key stakeholder. The individual champion will lead the effort, but there must also be an entity—a college, an employer association, or an economic development council—to convene the partners, create the vision, and implement the plan.

3. **There is no “one size fits all” approach.**
   Each state must determine what is needed, the vision for change, the ultimate goals to be achieved, and plan an incremental approach to get there.

4. **Take a good regional program and expand it.**
   If it’s too hard to go statewide all at once, build on successful, smaller programs incrementally in order to replicate it throughout the state.

5. **Persist and keep the momentum going.**
   It’s a work in progress. Keep at it, acknowledge the incremental steps as important, and continuously move towards an objective.

6. **Stay focused on filling the pipeline with the needed workers.**
   States need to produce more graduates with industry-recognized credentials to meet employer demand once the implementation efforts ramp up to achieve critical mass.

7. **Use Dream It. Do It.**
   Several states were able to boost the exposure of the certification system by rolling it into their Dream It. Do It. campaigns. This provided states with a strong marketing message that manufacturing is a viable career path.

8. **Supplement your existing labor market information.**
   It is necessary to invest in some additional data gathering and state-specific surveys to get a full picture of the trends, projections, and needs in the manufacturing industry.

9. **Use the technical expertise of The Manufacturing Institute.**
   The Institute has developed tools and materials, sponsors webinars, and provides research support, technical assistance, and help with convening and facilitation that states have found to be an invaluable resource.
Recommendations

1. Develop a comprehensive repository of state-level policy and legislative proposals, concepts, and changes that will feed policy discussions at the federal level and provide a rich source of information for states to consider as they move further down the path of education reform.

2. Develop a model for integrating workforce development, economic development, and education strategies in support of statewide deployment of the Skills Certification System.

3. Continue to help states make the case for industry credentials.

4. Expand the learning network to encourage even more sharing of best practices among the Lumina-funded states, and broaden the reach of the webinars to all 50 states.

5. Complete the toolkit for employers and education institutions, and build a toolkit for workforce development agencies.

6. Continue to serve as facilitator/convener and the primary broker of information to all champions and leaders involved in the project.
Introduction

The Manufacturing Institute initiated this independent evaluation of its effort to scale and advance the model of creating educational pathways aligned to career pathways in advanced manufacturing using the NAM-Endorsed Manufacturing Skills Certification System (SCS). The project is receiving support from a Lumina Foundation for Education grant during the four-year period from 2010 to 2014. The purpose of the evaluation is to quantify the value of the grant activities to educators and employers and to recommend improvements to the process flow that can be incorporated into project activities during the remaining period of the grant.

“Moving Systemic Reform Across 12 States to Implement Nationally Portable, Industry-Recognized Credentials in Advanced Manufacturing Educational Pathways” was funded as part of the Lumina Foundation’s goals to increase the percentage of Americans with high-quality degrees and credentials to 60 percent by the year 2025.

The Manufacturing Institute originally proposed this project to the Lumina Foundation with the overarching of scaling up, implementing, and widely publicizing the availability of postsecondary education programs of study aligned to industry-recognized credentials and to career pathway in Advanced Manufacturing, which span from high school through community colleges and into four-year college programs of study. This large-scale effort implemented across 12 states is intended to increase postsecondary participation and credential completion, enabling students and working learners to contribute to the workforce, improve society, and provide for themselves and their families.

The Institute has organized a system of “stackable,” nationally portable, industry-recognized skills certifications that identify the basic/foundation competencies and skills requirements across all sectors of the manufacturing industry. The SCS identifies the core or basic skills that are building blocks in virtually all careers in Advanced Manufacturing across multiple occupations in multiple sectors.

The educational programming associated with these industry-recognized credentials can be integrated into high school, community college, and four-year college/university programs of study as stackable credentials. As a result, students and working learners have pathways in education in which postsecondary credentials are earned and stacked along the way, creating more on and off ramps in postsecondary education for those who must learn and earn. Since the credentials are integrated into degree programs of study, students are “banking” credits toward achievement of degrees.
Higher levels of advanced skills identified by industry build on these core skills and provide career pathways and advance opportunities in specific sectors or in specific occupations, responding to local labor market needs and job availability. Educational pathways to gaining these high-level skills can be mapped to college or university baccalaureate and graduate-degree programs, online educational programs of study, work-based learning and/or apprenticeship programs to the journeyman and master levels. Successful attainment of the core skills prepares working learners for entry-level employment success, advancement in careers, and pathways to higher education.

This process is designed to achieve the following objectives:

- align the necessary leadership across business-education-workforce-economic development to support implementation with policy and resources;
- provide technical assistance to “early adopter” postsecondary education institutions prepared to integrate the industry credentials into their degree programs of study; and
- share best-in-class national tools to facilitate implementation.

This evaluation focuses on the degree to which the Institute met these objectives through analysis of the activities, successes, and challenges in each of the states and at the national project level.
Evaluation Approach and Methodology

The approach used to evaluate the Institute’s success in achieving its process objectives included two components:

1. Qualitative analysis through one-on-one interviews with Manufacturing Institute leaders and primary project stakeholders in the 12 states. This included interviews with project participants and sponsors at the Institute and in state and regional manufacturing associations and community colleges. Two separate interview protocols—one for state associations and one for educators/colleges—were used to identify the unique experiences of the project’s two major stakeholder groups and to evaluate the similarities and differences in their views of how the process unfolded.

2. An analysis of actual documentation of project activities, including state-level work plans, annual reports to the Lumina Foundation for Education, and supporting materials developed and utilized by The Manufacturing Institute to support state-level implementation.

The topics in the interview protocols were aimed at understanding the starting point in every state, successes and challenges in the states’ process, their approaches to involving employers, institutional barriers they encountered and how they overcame them, the most significant outcomes achieved, how they were able to leverage the Lumina-funded activities, the role of state policy and policymakers in advancing the goals of the project, the most important lessons learned that would serve as guidance for other states, and the type of support states still need to continue their progress and momentum.

Data from each of these components has been synthesized and articulated in a set of findings that document the effectiveness of the project’s process to date, lessons learned, and recommendations for how the Institute should direct its efforts to support the 12 states in the remaining period of the grant.

Many of the findings included in this report reflect perceptions that were expressed repeatedly in interviews. We did not attempt to “validate” these perceptions; the purpose of the evaluation was to document stakeholder views of the process and progress achieved to date and to identify the needs of the states going forward.
Findings

In our analysis of stakeholder input, a powerful overarching theme emerged: all of the states have been able to advance the use of nationally portable, industry-recognized credentials at a pace and to a level that would never have been possible without the Lumina grant and technical support of The Manufacturing Institute.

While every state began its effort from a different starting point, and the accomplishments and impacts for each state were different, one stakeholder captured in a concise and impactful way what every state reported as a success: “We were nowhere with skills certification and career pathways in advanced manufacturing at the beginning of the project. If it were not for the Lumina grant, we wouldn’t be where we are today. It was the catalyst. It brought all of the pieces together to get the whole thing moving forward.”

Many states were able to position their community colleges to leverage federal resources and other private grants, and to obtain state general fund dollars and policy changes that reward industry certifications and strengthen community colleges and career/technical education. All of the states have a leadership group in place that is championing the efforts. New and even unprecedented levels of collaboration between community colleges and manufacturing employers have been achieved and sustained. Manufacturers in each state are now organizing collectively behind skills development and early adopter community colleges are integrating postsecondary pathways based upon real-time economic data of in-demand jobs and projected growth. The number of certifications issued that support advancement of individuals into high-demand manufacturing jobs has increased dramatically.

The Institute has accelerated the SCS in Lumina-funded states and across the nation through tools, best practices, and resources it collects, documents, and distributes to help colleges, employers and other stakeholders to act in their own communities. All of the states reported that hands-on technical assistance from The Manufacturing Institute, from help with research to creating a learning community among the Lumina-funded states, was crucial to advancing their state vision and implementing their plans. Some of the Lumina-funded states have received requests for guidance from states that have not begun down the pathway.

Alongside these significant gains are challenges that will require a national policy framework. This framework will support what states are trying to accomplish and will provide for continued resources, enabling the broad impacts only a handful of states have been able to realize thus far.

Some states have not yet aligned their education, workforce development, and economic development policies in a way that will advance certifications aligned to the SCS in order to meet the needs of manufacturers in their communities. Some states have seen turnover in the leaders championing the effort. Some states have not been able to build a statewide focus and initiative
and are advancing their efforts “one employer at a time, one worker at a time.” Several states reported that not all colleges see the value of certifications, and manufacturing jobs are still a hard sell to students and workers.

The prevalence of these needs points to the ongoing value of the Lumina Foundation and The Manufacturing Institute in supporting states as they work to build career pathways to family-sustaining jobs through the industry-based credentials.

**FINDING 1:**
The effort changed the conversation about the importance and value of nationally portable, industry-recognized credentials and helped galvanize and support systemic change in some states.

This project has changed the conversation about manufacturing certification on the national level in a very short period of time, with a relatively small investment. Working with industry partners such as The Manufacturing Institute, the National Council for Advanced Manufacturing and the Society of Manufacturing Engineers, the U.S. Department of Labor released an updated advanced manufacturing competency model. This model outlines the skills necessary to pursue a successful career in manufacturing. DOL has also prioritized the funding of training programs that have industry credentials behind them and is promoting the importance of credential attainment by adopting high-priority performance goals to increase credential attainment by 10 percent among customers of the public workforce system.

President Obama’s announcement during year two of the Lumina grant and its goal of preparing 500,000 workers for cutting-edge manufacturing jobs, provided momentum to the Institute and the Lumina-funded states’ efforts. It set the stage for new and creative public-private partnership and brought attention to the challenges faced by the nation’s manufacturers in acquiring the skilled workers they need, the importance of manufacturing to compete in a global economy, and the value of manufacturing jobs in providing a living wage. Building on the President’s commitment, Congress passed the Veterans Skills to Jobs Act, which makes it easier for veterans to access industry certification and find work, translating the skills they gain during service to the civilian workforce. The Manufacturing Institute has expanded on these models for competency-based education and credentials, including launching virtual “badges” for veterans to highlight their military training and experience.

The project has provided the Institute with the experience to help states achieve community-based action more quickly and the Lumina Foundation with the framework to help states do this work in other industry sectors. It brought attention to the validity of industry credentials and opened the door to discussions about policy barriers. Since the beginning of the grant period, governors and legislatures in several states took definitive actions to change policy and appropriate more funding to move the needle on industry credential attainment.
There has been no singular achievement more remarkable than Indiana’s initiative: Increasing the Percentage of Hoosiers with High-Quality Credentials in Advanced Manufacturing. In a very short period of time, with support from a Lumina Foundation grant and The Manufacturing Institute the state was able to redesign academic programs, increase employer engagement and support, and align policies in support of completion and student success. In just two years, Indiana moved from fifth to third in the nation in state ranking relative to the delivery of manufacturing certifications. Its early adopter college, Ivy Tech, used the investment of grant dollars to drive long-term change in how education is delivered in support of completion. This included the design, development, construction, and offering of affordable degree programs and training platforms that are aligned and coincide with nationally recognized certifications. During the two year period of the grant, Ivy Tech expanded the number of courses and programs that transfer to colleges and other universities in Indiana, including Purdue and Indiana State University. Ivy Tech and Purdue have collaborated to form the Indiana Next Generation Manufacturing Competitiveness Center, where both institutions will offer classes, create proof-of-concepts, completed advanced prototypes and engage industry with applied research, including workforce development that supports Indiana’s high technology advanced manufacturing firms.

There are other notable examples of successful movement in the other 12 Lumina-funded states toward implementation of the SCS:

- In Kansas, Governor Brownback released a plan that incentivizes pathway alignment with K-12 and postsecondary education. The Excellence in Career and Technical Education Act invests new state dollars for career and technical education (CTE) to encourage high school students to enroll in college-level CTE programs and earn industry-recognized credentials. Kansas high school students can qualify for free college tuition in approved technical courses offered at Kansas technical and community colleges, and high school districts are awarded $1,000 for each student graduates from that district with industry-recognized credentials including MSSC, NIMS, and the NCRC in a high-need occupation. The governor also included in his budget $8 million to fund the CTE Tiered Funding formula, which incentivizes the expansion of in-demand technical programs in colleges. These two investments represent a 14 percent increase in the budget authority during a time when the overall state budget was reduced.

- The Florida State Legislature passed two pieces of legislation to improve STEM-related fields. One establishes a degree completion program to recruit, recover, and retain adult learners and assist them in completing degrees aligned to high-wage, high-skill and workforce needs. The other requires better educational reporting to inform students of employment and economic outcomes and requires the State Board of Education to adopt a unified state plan for STEM to improve K-12 and postsecondary STEM education, and prepare students for high-skill, high-wage and high-demand employment in STEM-related fields. Furthermore, through the efforts of the Manufacturer’s Association of Florida, two community colleges opened Manufacturing Institutes.
Using funds awarded from its Race to the Top Grant, Illinois was able to accelerate implementation of Illinois Pathways, a new and innovative, state-led, STEM education initiative designed to support colleges and careers readiness for all students. Through partnership between State of Illinois economic development agencies, Illinois Pathways supports local programs that empower students to explore their academic and career interests. The SCS has been included as part of the model for manufacturing programs of study. Illinois Pathways also creates new, statewide, public-private partnerships known as “Learning Exchanges” that better coordinate investment, resources, and planning for those programs. The Learning Exchange will create a new, innovative, public-private education infrastructure that can advance college and career readiness in STEM disciplines.

Iowa has made significant gains in K-12 and community colleges. The state has aligned programs around NAM skills certification system-wide and coalesced around third-party evaluation as the gold standard. Governor Terry Branstad initiated the Skilled Iowa Initiative, a program that provides assurance to employers and potential employers that local workforce have the skills and abilities to fill job openings. The initiative will promote the National Career Readiness Certificate for potential job seekers, encourage businesses to hire certified workers when applicable, and provide resources to those looking to improve skills.

In Nevada, businesses worked with K-12 education to develop a combined definition of “career” and “college” ready and to determine how state will test for it. The state has embraced a definition that promotes students pursuing certifications with the key performance indicators inclusive of nationally portable credentials.

In Alabama, a statewide Career Technical Education Commission was formed to reform K-12 career technical curricula. One of the outcomes was the need to align curriculum with career pathways and industry credentials, including the SCS. These efforts will also align and articulate with postsecondary education and encourage dual enrollment.

Mississippi’s governor recently signed legislation enabling “Mississippi Works,” a dual enrollment–dual credit measure. The bill aims to transition potential and recent high school dropouts into workforce training, giving them the opportunity to complete their high school education while working on a skill certification. The Alabama Board of Education declared that every high school senior would be given the National Career Readiness Certificate (NCRC), which is the first building block of the NAM-Endorsed Manufacturing Skills Certification System. There is a new collaborative effort between secondary and postsecondary schools toward aligned career pathways and fully-articulated credits. They have identified several “clusters” of subjects and coursework leading to eventual careers. Eighth graders will now identify one cluster of interest, and they are advised on a curriculum of coursework pertaining to that cluster, including career technical classes that could lead to credentials in their field of study. When applicable, students are offered college-level classes for credit, funded by the state.
In Arkansas, the primary outcome of the Lumina-funded project is an institutional shift in occupational programs to align with third-party certifications. The state is also developing one-semester programs based on The Manufacturing Institute’s Right Skills Now model that provide workers a rapid path to employment. These blocks are then stacked towards achievement of an Associate of Applied Science Degree that fully articulates with a baccalaureate degree.

**FINDING 2:**
The state-level leadership convening activities supported by the Lumina grant resulted in unprecedented partnerships and collaboration and served as a genesis for building a vision and strategy that states could implement.

All states were able to successfully convene participants in business, education, and government/policy to align their leadership and goals and develop a plan for implementing educational pathways integrating the SCS. Most states reported that these convenings brought the partners together in a level of conversation that had never before occurred regarding industry/employer needs and how the education system must do things differently in order to provide workers with the level of skill that is required in advanced manufacturing jobs and occupations.

Some states noted there were “pockets of success” where businesses and colleges have historically worked effectively together to build programs and curriculum that will meet industry needs. However, most states said employers entered the convening process highly frustrated with the education system and its past performance and lack of understanding of the potential for industry-recognized certifications to reform education. For example, a survey of employers conducted by the Manufacturing Association of Florida showed that community colleges were considered to be the last place to go when looking for skilled workers to fill their job openings. Convening employers first to help them develop a unified and constructive message and then convening them together with the education partners helped alleviate some of this tension and move the discussion forward toward strategies and efforts that businesses and colleges engaged in cooperatively.

Most states said the convenings were absolutely necessary in order to understand who all of the players are, what and where the resources are that can support the system, what the roles of each partner should be, the underlying need for private sector involvement as the driving force, and what type of policy changes, legislation, and/or political support is necessary to set things in motion to achieve publically-stated goals.

Another result of the convenings identified by several states was that it moved the dialogue to a place where common questions are now regularly asked by all of the stakeholders, and all of the players are beginning to realize the importance of workforce development and how the state’s economy is tied to the individual success and overall quality of life. The convenings alone served
to raise the awareness of the importance of nationally portable, industry-recognized credentials and to help community colleges and K-12 education begin to identify ways they can incorporate skills certification into education and workforce training.

**FINDING 3:**
Lumina funds served as an important building block in mobilizing states to successfully pursue continued funding.

The Foundation’s name, reputation, and the initial grant funds received by each state opened doors and gave credibility to what states were doing and facilitated the Institute in organizing a consortium of 15 community colleges to seek federal funding through the TAACCCT initiative to support SCS expansion. In Iowa, all 15 community college districts joined a single consortium, with advanced manufacturing as its sole industry, and the SCS as the core of operations. Illinois, Wisconsin, Florida, and New York also put forward a similar proposal.

The language in the proposal supported industry certification, including strong support for national credentials and an emphasis on prior learning assessment. Six states—Florida, Illinois, New York, Wisconsin, Arkansas, and Iowa—each received multi-million dollar grants. In addition, Wichita Area Technical College in Kansas was the lead college in a multistate award for a National Aviation Consortium (NAC). The NAC project is bringing together aviation and aerospace employers in Kansas, Oklahoma, North Carolina, Indiana, and Washington State to define career pathways for the aviation sector and to align them to the SCS.

In all, more than $175 million of the $500 million awarded by U.S. Department of Labor for the TAACCCT program in the second round are dedicated to projects in advanced manufacturing. TAACCCT provides community colleges and other eligible institutions of higher education with funds to expand and improve their ability to deliver education and career training programs that can be completed in two years or less and prepare program participants for employment in high-wage, high-skill occupations.

**States reported several other ways they successfully leveraged grant activities:**

As mentioned above, the State of Illinois was able to leverage its Lumina-grant funded work in a number of ways. The state legislature appropriated general fund dollars to fund a STEM learning exchange. Manufacturing was targeted for $430,000 of the state’s $2.5 million for Race to the Top grant, and the Illinois Manufacturing Association (IMA) has pledged a cash match for the manufacturing portion. IMA also reported the Lumina grant helped the association become involved in the State’s Workforce Innovation Grant of $6.2 million, which provides accelerated training in Illinois manufacturing. The association also leveraged other private donations and a grant from Motorola Solutions for skill development and certification.
Mississippi approved a diversion from its Unemployment Insurance trust fund to put $15 million into a workforce-training fund that will meet national quality standards and fill the pipeline of skilled workers that will meet employer demand.

In New York, The Manufacturing Institute partnered with SUNY College of Environmental Science and Forestry to obtain an H1-B grant to enhance training in sustainable materials and manufacturing. The project will increase the number of technicians, and the curriculum will align to the MSSC CPT certification. The project will also incorporate a webinar-based training platform that enables distance learning for the CPT certification.

Other states said the application of the Lumina funds to continually promote the importance of certification has driven the message home to community colleges and they are beginning to develop their curricula parallel to certifications pathways. While it is difficult to quantify this, dollars are leveraged because considering the certifications and pathways has become part of the process.

One state offered a very practical, on-the-ground example of how resources and funds can be leveraged to help community colleges build the capacity to deliver education and training programs that meet the needs of manufacturers. “We are encouraging employers who are purchasing updated equipment to donate their old equipment to colleges if it’s five years old or newer. When buying software, we ask them to buy an additional license and give one to the college. This is a cost-efficient way to bridge the gap between the outdated equipment colleges are teaching with and put into the classroom the technology employers are actually using in their production.”

**FINDING 4:**
While the most successful efforts were galvanized and led by business associations, engaging employers and sustaining their involvement can be challenging.

The majority of states found that the most effective champion of their efforts was an industry association or consortium, most often an association led by the manufacturing industry. In this way, state associations were able to empower employers to use the tools that are available through The Manufacturing Institute and move through the Institute’s 15 recommended steps.

Even when employer associations drove the charge, manufacturing industry champions repeatedly spoke of the process as “engaging one employer at a time” through listening to other employers who are using the certifications and credentials in the recruitment and screening and who have realized benefits from incorporating it into their hiring practices. Employers have a hard time seeing and understanding the value proposition unless they hear it from another employer and can be shown longitudinal data that demonstrates it works.
The effectiveness of employer engagement varied by each state’s “lever of change” and their level of aggressiveness in engaging employers in a meaningful way early in the process. For example:

- Nevada used a heavy employer engagement strategy to begin building out its pathway by funding internships and asking manufacturers to sign a Memorandum of Understanding. This memorandum states that manufacturers would hire into full-time jobs workers who had completed community college training programs as long as the workers could demonstrate the required skills. This was an unprecedented partnership between workforce training, economic development, education, and employers, who had previously been highly critical of the education system, to fast-track people on unemployment insurance into full-time jobs with benefits. The entire effort was driven by employer demand.

- In Illinois, Harper College engaged 54 local manufacturers and partnered with Wheeling High School and economic development professionals to roll out a new Advanced Manufacturing Technology program. The program aligns secondary and postsecondary manufacturing pathways and issues manufacturing certifications including the Manufacturing Skill Standards Council’s Certified Production Technician. The program will grow to include certifications by National Institute for Metalworking Skills and American Welding Society.

- In Tennessee, the project’s champion, Chattanooga Regional Manufacturers Association, chose to align stakeholders in state government, education, workforce development, and industry and “on-board” the most influential manufacturers creating jobs in the state, prior to an initial launch of its Lumina-funded initiative.

- Conexus Indiana created the Indiana Employer Pledge for Workforce Excellence in order to educate employers about credentials and other strategies to strengthen the quality of the workforce and to enlist their commitment to apply those strategies to their hiring and personal policies. This pledge has been signed by more than 70 employers. Other states have employed a version of Indiana’s strategy because the experience clearly demonstrated that employers are most enthusiastic when they are given choices of meaningful ways to engage.

Other states reported that employer engagement has been difficult because they are waiting for education to back it first. Industry is not always convinced that certifications are the right thing; there are still many employers who believe education should be focusing on graduating students who have basic foundational skills and employers should train them to their unique needs and standards. Some of the states said that employers often say that credentials force people to go to school too long and get certificates they don’t really need.

One state employer association that had a fairly successful employer engagement effort defined the challenge this way: “Getting manufacturers to buy into the credential system is tough. It can be hard to get employers to take it seriously and want to invest in it. We haven’t penetrated the market as well as we could. Manufacturers need to pay more attention to and make greater investment in the credentials and we need to help them understand why it is to their advantage to do so.”
Some states suggested in order for colleges to be successful in driving change in the programs, they need a critical mass of employers who buy in and can realize the benefit from the portability of the skill sets. If employers are involved in and have a relationship with their regional technical or community college, they are more likely to hear the message and become engaged.

On the other hand, just because one region or part of the state buys into it doesn’t always mean other areas or the whole state will follow. States reported that it can be especially challenging with smaller companies that are concerned that they are merely “feeder companies”—that they’d invest in training only to have their workers leave for another “preferred” company in the region or that they’d have to pay certified workers more money. The Manufacturing Institute has launched successive versions of an employer toolkit to address specific means by which manufacturers can effectively use certifications in support of their human resource objectives.

Places where *Dream It. Do It.* was adopted often had success with employer engagement when other efforts had failed. For example, the region in Wisconsin that adopted *Dream It. Do It.* had a single Chamber of Commerce that was able to involve all of its members. This helped to get many employers to embrace the program quickly.

**FINDING 5:**

*Even with increasing national and state momentum to adopt industry credentialing as a significant education reform strategy, there is still resistance to change among community colleges.*

In some states there was initial resistance and skepticism about certifications. States reported that some community colleges were afraid they would lose tuition revenue with either fast-tracked certifications or articulation agreements. Many educators mistrust standardized tests and are reluctant to embrace them—both because they doubt their effectiveness but also because they wonder if it’s just organizations trying to make money. Some states were able to overcome this resistance by having business and educational leaders take the tests themselves to prove their merit.

Many interviewees said their community colleges thought their existing programs were doing a good job—that their programs are effective, up-to-date, and only needed minor changes, and that this view is widely divergent from how employers see it. It takes a strong and compelling voice from employers to point out what is antiquated and needs to change. States said that one of the biggest barriers to moving forward is helping the schools and colleges step out of silos and be willing to hear the need/demand directly from manufacturers. Faculty members who have a great deal of ownership in the curriculum hold academic freedom as a high value. Suggestions are often met with a great deal of resistance. The business-led approach is very different; it requires a more nimble approach in responding to industry needs that colleges are not used to. There is also a higher standard to meet in developing the training and the skills of the instructors, and colleges are reluctant to invest out of concern the credential won’t keep pace with industry.
FINDING 6:
More work is needed to promote general awareness and understanding of skills certifications and their importance as an education reform strategy.

Nearly all of the states said that the Skills Certification System can be confusing and that it requires a tremendous communication effort to help all of the partners achieve a common understanding and shared sense of their importance. Some common questions states had to answer for their stakeholders: Are these stackable credentials new? Do they compete with other certifications or are they the same thing? What is the beginning point?

Many states said that finding resources to support communications marketing dollars is a challenge, and the ability to spread awareness through a statewide campaign—for everyone to hear the same message at the same time—was critical to launching and sustaining their efforts. Gaps in funding and job turnover in key leadership positions impeded the ability to move forward with a cohesive message and vision, forcing several states to stop or slow their progress.

FINDING 7:
The number of certifications has increased substantially.

As part of the Institute’s national goal of awarding 500,000 certifications by 2016, the certification bodies endorsed as part of the SCS have issued 173,289 certifications to individuals, positioning them for employment and advancement in in-demand manufacturing jobs. Of the certifications issued, 36,698 have been issued in the 12 states funded by this project. Technical certifications in the 12 states rose by 17 percent, with 5 states (Florida, Illinois, Iowa, Mississippi, and Kansas) showing more than 20 percent growth. Florida’s growth was a remarkable 70 percent over 2011, demonstrating the impact of the skills certification efforts.

Two states did show annual declines, which reflect some of the vagaries of what is still a highly devolved technical education system. As noted elsewhere, the longer-range efforts, including the impact of TAACCCT grants in both Kansas and Wisconsin, point to growth across the 12 states.

Anecdotally, some states reported they have surpassed their original expectations and as momentum increases they are seeing their result amplify year to year. For example, in Illinois, the number of MSSC credentials grew substantially.
The Institute learned quickly when assisting the states that there is no one size that fits all. Each of the states was at a different place on the pathway—with different policies, strengths, weaknesses, and partners. Rather than mandate a beginning point, the Institute helped the states identify their unique “lever of change” depending on current visions and strategies related to economic development and job creation, education, talent development, political and economic, landscape, and relationships among business, education and government sectors. There was a wide range of diversity in these levers. For example:

- Florida and Arkansas have used broad-based education reform efforts as ready platforms to drive education–career pathway alignment.
- Illinois chose a college completion agenda driven by its P-20 Council.
- Mississippi leadership drives its initiative through a Blueprint for Business Action led by the governor.
- Iowa and Illinois are focusing their talent development through innovative economic-development strategies that require a STEM-capable workforce, structuring their efforts as a continuum and providing guidance on the logical components that comprise a systemic approach.

### Technical Certifications in Grant-Funded States

<table>
<thead>
<tr>
<th>STATE</th>
<th>TECHNICAL CERTIFICATIONS 2011</th>
<th>TECHNICAL CERTIFICATIONS 2012</th>
<th>INCREASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>880</td>
<td>908</td>
<td>3%</td>
</tr>
<tr>
<td>Arkansas</td>
<td>297</td>
<td>310</td>
<td>4%</td>
</tr>
<tr>
<td>Connecticut</td>
<td>654</td>
<td>693</td>
<td>6%</td>
</tr>
<tr>
<td>Florida</td>
<td>2,462</td>
<td>4,184</td>
<td>70%</td>
</tr>
<tr>
<td>Illinois</td>
<td>2,411</td>
<td>3,246</td>
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</tr>
<tr>
<td>Iowa</td>
<td>353</td>
<td>451</td>
<td>28%</td>
</tr>
<tr>
<td>Kansas</td>
<td>480</td>
<td>442</td>
<td>-8%</td>
</tr>
<tr>
<td>Mississippi</td>
<td>623</td>
<td>756</td>
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</tr>
<tr>
<td>Nevada</td>
<td>271</td>
<td>336</td>
<td>24%</td>
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<tr>
<td>New York</td>
<td>1,517</td>
<td>1,601</td>
<td>6%</td>
</tr>
<tr>
<td>Tennessee</td>
<td>837</td>
<td>836</td>
<td>0%</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>2,551</td>
<td>1,858</td>
<td>-27%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13,336</strong></td>
<td><strong>15,621</strong></td>
<td><strong>17%</strong></td>
</tr>
</tbody>
</table>

**FINDING 8:**
Most of the states were starting from scratch, but were able to galvanize their effort to gain traction more quickly by organizing around a “lever of change.”
From these unique starting points, the Institute used a consistent 15-step process to guide each state in a systemic approach. The NAM-Endorsed Manufacturing Skills Certification System Implementation Checklist served as an effective guide to help each state evaluate their readiness for implementation by determining if they had taken the critical steps that lead to successful implementation SCS. While NAM’s steps are not purely linear, they do build upon one another, providing a consistent national structure while also allowing states flexibility in their approach.

**FINDING 9:**
*Nearly all states were able to develop scalable models but many found it challenging to take them to scale statewide.*

Many states had challenges that led to difficulties coordinating a statewide effort. Several states commented on the independent structure of their community college system and how doing something system-wide threatens their academic autonomy. A few other states were parochial in every facet (government, industry, education), and regions pride themselves on doing things their own way. In some states, there is strong competition among various businesses or colleges, which can make it difficult to build the necessary partnerships and critical mass required to drive statewide reform. Most states were able to overcome these challenges by selecting a policymaking or industry leader as a unifying champion of the process and using the outside, trusted, third-party endorsement of The Manufacturing Institute.

The most significant challenge is securing funding to expand the model and sustain the effort long enough where it is imbedded in statewide systems. States that were awarded TAACCCT grants from the U.S. Department of Labor will be able to expand their efforts more broadly without losing momentum. However, the considerable investments required to integrate the model systemically will take the combination of resources of states, private foundations, employers, and federal programs—and leveraging them to achieve the desired result.

**FINDING 10:**
*There has been genuine excitement about the project its objectives across a wide range of stakeholders.*

When the Institute reached out to each state to prioritize which would be first to implementation, every state stepped up and asked to begin in year one. We have documented elsewhere in this report the growth of the skills certification effort, fueled by public-private partnerships and the success of early adopters. It is clear from our research that industry certification has become a touchstone for bridging employers, education, and workforce development.
Lessons Learned and Guidance for Other States

While each state had its own unique vision or “lever” for success in deployment of the Manufacturing Skills Certification System, collectively the Lumina-funded states shared some common experiences and challenges that are instructive to states just embarking on implementing nationally portable, industry-recognized credentials in advanced manufacturing educational pathways. Some of these “lessons learned” provide insights and powerful guidance that will allow other states to plan more effectively for the known challenges and will enable them to gain traction more quickly.

1. **The effort has to be employer-driven.**

   This was by far the most common theme that emerged from the interviews with states. Unequivocally, states agreed that businesses need to be the convener and driving force behind the effort, even if a college or education entity is ultimately selected as the champion for implementation. Without the backing of industry and manufacturing employers in particular, the effort is likely to fail. States should involve business early, listen to what they say, and provide a tangible, meaningful part to play in planning and implementation. One state representative said it was critically important to make the entire “ask” about something tangible for employers and that would result in business-to-business engagement: “I engaged businesses by getting them to commit to one internship and then I asked that employer to pick up the phone and call at least one other manufacturer and get the word out.”

   Both employers and educators should be given the information they need about skills certification to participate effectively in the conversation and should be “coached” to leave aside past biases and approach the conversation with a solutions-oriented mindset.

   In the convening stage, employers often don’t want to talk to people from government and education. They participate best in a business-to-business dialogue and will respond best to a compelling message from trusted and credible source—a respected employer or a legitimate association that advocates for their interests.

   Many states found that their statewide business or manufacturing association can be an articulate voice and lend the kind of credibility needed to get and keep employers engaged so the model is deployed appropriately. Associations are especially poised to set the stage for an effective dialogue with educators by preparing their membership to send the right message in
the right way. One state manufacturer said it this way: “My message to my colleagues is: ‘Stop complaining that the education system doesn’t provide what you need. Come to the table informed about what you actually need, and be polite in telling them what you need. If you have an association that can help integrate the message from individual employers and communicate it in a respectful and articulate way, then you can get the educators to listen.”

Several of the states emphasize the need to employ a number of methods for communication—and to try a lot of different ways to spread the word. A number of states used their economic development partners to support a continuous outreach effort to engage manufacturers in a dialogue about the issues and needs that are most important to them and identify if there are policy changes that will help.

States also expressed a need for caution and careful planning about amount of time employers are asked to give and recommended scheduling meetings and forums that are convenient for them. It is important to have a refined message and be purposeful in why you’re convening them or they will become frustrated and feel as though they are wasting their time.

2. **Select a state champion to drive the change.**

Most states preferred the champion to come from within industry (especially since many employers do not trust government or educators to have their best interests at heart). Others wanted a policymaker to embrace the message and back it up with legislation to make everyone accountable. The most significant lesson learned is that one of the key players—a college, an employer association, or an economic development council—has to take the lead in convening the partners, creating the vision, and implementing the plan. The selected champion has to have a combination of the right leadership, structure and ability to influence policy in order to lead a successful effort.

While some states said the engagement of political leaders as champions is not necessary at the beginning, nearly all states found that interest and sponsorship from governors and legislative leaders was needed to gain more attention and momentum for the initiative, and eventually to make policy changes and secure the long-term public investments required to make the system changes. States with strong, supportive policymakers were able to earmark and secure additional funding for education and workforce training (particularly career and technical education) and reform their education policies to so that community colleges and four-year institutions tie their programs to economic development goals. A representative from one state association commented: “If I had to do it over again, I would insist upon policymaker input and involvement—someone who can put policy into place and say, ‘Our state will do this.’”
3. **There is no “one size fits all” approach.**
   The most important advice the Lumina-funded states conveyed was on how to begin this effort: work backwards! Determine what is needed, the vision for change, the ultimate goals to be achieved, and plan an incremental approach to get there. It is also important for each state to assess its strengths and weaknesses based on that vision, analyze what gaps exist, and how those gaps will be addressed. This approach applies both from an educational perspective (start with what companies need, then back into the curriculum) and also from an economic development and legislative perspective (e.g. what kinds of companies do we want to invest in our state, then how do we get them here?).

A couple of states recommended contracting with a third-party facilitator to manage the discussions in the convening meetings. There are often long-standing negative or divergent viewpoints, particularly between community colleges and employers that create tensions and can cause a breakdown in the dialogue. A professional facilitator with a proven process and expertise in working through competing interests and conflict can bring the needed neutrality that helps move participants past their long-held positions, leading them to consensus and a solid plan for moving forward.

4. **Take a good regional program and expand it.**
   Many states have successful programs at one college or one district, based on either a good relationship with employers in that region or an involved politician in that region. If it’s too hard to go statewide all at once, states found it is possible to build on those programs incrementally in order to replicate it throughout the state.

Illinois used this model. William Rainer Harper College began hearing from employers that they could not find skilled workers for their advanced manufacturing jobs. Working collaboratively with the state association and individual manufactures, Harper built a curriculum aligned with industry-defined qualifications and started embedding industry-recognized certifications, starting with Production Technician. The college is now working to introduce and integrate the program in the state’s system of 21 community colleges, as the lead in a TAACCCT grant.

5. **Persist and keep the momentum going.**
   All of the states referred to their skills certification initiative as “a work in progress, not a one and done.” They emphasized that one of the partnerships could be doing just one more thing to barely move the needle. This calls for an approach that continues to make the case for the need and acknowledges the incremental steps as important. Such an approach gives visibility to the small successes along the way and continues to make the investment of time and resources that will build and sustain the effort statewide.
A representative from one of the state associations said: “You have to keep at it. Legislators often say, didn’t we address that already? Didn’t pass a law on that? New initiatives come from the federal level that influence where you go and everyone is competing for the same resources. You have to continuously move toward an objective. You have to keep translating the message in ways that resonate with each audience until importance of the certification process is recognized by everyone.”

6. Stay focused on filling the pipeline with workers.
Many states reported there are not enough workers in the pipeline who are ready to go into high-demand jobs, and employers who have invested in the system get frustrated if they have to wait too long for the colleges to produce a result. States said they need to focus on producing more graduates with these credentials as more and more employers advertise for them as a routine of doing business. States emphasize that the message about the need and demand has not been created through an intentional and sustained marketing/communication strategy aimed at colleges, students, and workers that would begin to create the supply needed to take the model to scale.

The project leaders in Illinois emphasized the importance of building the supply starting in high school and even middle school. For example, Harper College brought K-12 education to the table and identified 12 “feeder” high schools that can supply students for the manufacturing pipeline.

States need to do whatever they can to help employers understand the importance of marketing the demand for workers with these credentials. The use of credentials in recruitment and hiring practices needs to become embedded in the culture of HR staff and the entire manufacturing community if they want a steady supply of applicants that have the skills certifications they are demanding for their advanced manufacturing jobs.

7. Use Dream It. Do It.
Several states were able to boost the exposure of the SCS by rolling it into their Dream It. Do It. campaigns. This provided states with a strong marketing approach—particularly to students, parents and counselors—that manufacturing is a viable career path.

*Dream It. Do It.* is an Institute-led network and the grassroots authority on influencing the perception of manufacturing careers by leveraging strategic partnerships to attract and recruit a qualified manufacturing workforce. Currently in 26 states, the program supports manufacturers’ engagement in youth-focused activities, ranging from mentoring and internships, to social media, to full-fledged advertising campaigns.
For example, Mississippi produced in partnership with Mississippi Public Broadcasting and Jobs for Mississippi’s Graduates a series of videos called “Job Hunters.” The videos, created for the state’s梦它. Do it. initiative showcases young people working in new and advanced manufacturing careers in places like Nissan and Toyota. The workers in the video talk about their salaries and benefits, where they received training, and how much they enjoy their work.

梦它. Do it. often provided a viable path to launch a small-scale effort in building awareness and actually implementing advanced manufacturing certifications by expanding the capacity of manufacturing associations to reach and move their constituencies. For example, Wisconsin, Iowa, Florida, and Illinois all launched expanded statewide梦它. Do it. campaigns through committed manufacturers to engage, educate, and employ manufacturing talent within community colleges and technical schools. The Northern Nevada Development Authority developed a comprehensive strategy and sustainability for deploying the SCS with梦它 Do It serving as the recruitment arm. Part of the sustainability strategy was to create an industry-led 501(c)(3) organization that was flexible and able to serve all areas of the state. DIDI Nevada officially became that organization and, with powerful leadership on the board of directors and support from the state’s senators and governor, it has served as a powerful lever of success for implementing the SCS.

8. Supplement your existing LMI data.
Every state agreed that while the available state and national Labor Market Information data is helpful, LMI is often not the best barometer and it is necessary to invest in some additional surveys/data gathering to get a full picture of the trends, projections, and needs in the manufacturing industry. Several states mentioned using their own data and analysis (some of it formal, some informal) to project potential growth and to better align with the known employers in their region. They all submitted a plan that used LMI (often heavily supplemented with surveys conducted by their state manufacturing association and/or NAM/Institute data) to identify their critical needs. Every work plan had to speak to how LMI was informing the direction they were going. However the case that states needed to make for other grant funding, such as the TAACCCT grant, often wasn’t sufficient with LMI alone.

Many states found that their state-level data wasn’t classified in a way that matches actual manufacturing conditions. Department of Labor statistics did not fully reflect potential growth in manufacturing that surveys conducted by employer associations were showing. To address this challenge, The Manufacturing Institute subcontracted with some data analysts to mine information that wasn’t readily available from the state. State LMI shops focused on growth, so employment appeared negligible. When the contracted data analysts starting looking at project retirements, it changed the picture and the conversation.
9. **Use the technical expertise of The Manufacturing Institute.**

Every state said that it would not have been able to undertake the Lumina-funded work without the research expertise, facilitation, and technical assistance provided by The Manufacturing Institute. This help ranged from:

- Institute-sponsored Community of Learners Network, which is a series of webinars that allow 12 states and the 4 Gates-funded states and Indiana to share lessons learned and best practices. This community has expanded to include more than 200 leaders from education, workforce agencies, associations, and employers.

- Printed education and awareness materials for states to use at the convening meetings.

- Detailed information and assistance in understanding the credentials.

- An implementation checklist and self assessment for a multi-step process to guide states through a successful implementation.

- A toolkit for the two major stakeholders—employers and education institutes—that are organized on the Institute’s website in a customer-oriented approach.

- State-specific requests for assistance with data, building their strategy for convening the partners, and developing grant proposals.

One state characterized the help it received from the Institute this way: “With every bit of assistance we received from The Manufacturing Institute, it helped us get it right and not make errors that would have been very difficult to recover from or retract. We took their models and put them to work on the ground. We used all of their research to justify the need.”
Recommendations for Process Improvement

The perspectives gathered to produce this report provide an insightful view into what the states need to continue implementing their plans, and how The Manufacturing Institute can direct its focus, activities, and capacity to help the states build upon their success and keep momentum going. The following are a few summary-level recommendations for improving the process for the remaining period of the grant. These are suggestions the Institute can consider, refine, and prioritize with further input from the states.

The first three recommendations are activities and support the Institute has not yet provided to states in a coordinated manner. The second three recommendations involve enhancements to technical assistance the Institute has been providing to states since the beginning of the grant.

**Develop a comprehensive repository of state-level policy/legislative proposals, concepts, and changes that will feed policy discussions at the federal level and provide a rich source of information for states to consider as they move further down the path of education reform.**

Only a handful of states have made significant policy reforms within their education and workforce development systems to drive the alignment of educational programming with the skills needed by today’s advanced manufacturers. All the Lumina states said that some of the academic policy changes that support the full integration of stackable, industry-recognized credentials are complex, difficult to communicate, and challenging to enact and implement, and that getting help from other states that have already navigated that territory could accelerate their efforts and help them avoid pitfalls. States were most interested in having access to a comprehensive set of materials from other states that have achieved systemic deployment of stackable credentials.

**Develop a model for integrating workforce development, economic development, and education strategies in support of statewide SCS deployment.**

States were frustrated at having to settle for pockets of excellence at the regional level. Workforce development, with all of its multiple programs, funding streams, and systems, is difficult to integrate. States said, without systemic change in these systems at the state and local levels, it will be hard to “move the dial” as much as they would like. Each industry sector talks about it slightly differently, and we haven’t been able to inform the full public conversation about the world of work and what it takes to be successful in job training and education. There is a need to get above the sectors and impact workforce training at the systemic level.
One state said its biggest challenge was helping all stakeholders understand the big picture and how they have a vested interest in achieving a skills certification system. An integrated model would illustrate that everyone gets something from it: K-12 (higher graduation rates), community colleges (higher completion rates), workforce development (decreased unemployment and improved labor exchange), economic development (proof of a skilled workforce to attract new companies), policymakers (proof that things are working in their state), and employers (skilled, job-ready workers).

In addition to a model that could be applied at the state level, both the Institute and the Lumina-funded states need to collaborate to build the foundation for a National Policy Framework for Action—a complete set of federal, state, local, and public-private, model policies that an employer should have; the right policies about who pays; and a bridge between 2-year and 4-year programs.

The approach and outcomes of the Indiana model could serve as a strong catalyst to impact student outcomes and postsecondary success nationwide. The articulation report that Indiana produced, along with all of the concepts and reforms the state is pursuing as a consequence of Lumina-funded activities, could serve as a beginning point for developing such a model. The experience of Ivy Tech in fundamentally changing the way the college thinks and acts could serve as a strong “lever of change” for reform in the community college system across the country. Ivy Tech has worked in a manner that has driven transformational change, and the data collected over the period of its Lumina grant clearly points to best practices within the system. In addition, the Roadmap for Manufacturing Education created by The Manufacturing Institute in partnership with Purdue University and Ivy Tech can be used as powerful vehicle for driving national education reform. The Roadmap and the policy alignment in Indiana and other leading institutions illustrate the important of articulation from high schools to four-year institutions. While articulation has its own unique challenges, the Roadmap proved that those challenges can be met.

**Continue to help states make the case for industry credentials.**

Nearly every state struggles to build the level of awareness and understanding required to implement an integrated approach to embedding industry credentials into educational pathways. The level of effort required to market to employers, educators, and other partners is arduous, continuous and requires resources beyond what most states have. The Institute has done a good job of providing materials and messages for states to use in awareness efforts. States are now looking for a more sophisticated level of support to help sustain marketing, outreach strategies and campaigns. Broader marketing and outreach efforts will engage more employers, make a stronger and more compelling case for the work, and help states find resources to fund the purchase of media and other kinds of publicity to reach both the “supply” and “demand” audiences. State employer associations also want more help in determining how to engage their existing structure of regional associations so they can get more traction.
Expand the Community of Learners to encourage even more sharing of best practices among the Lumina-funded states, and broaden the reach of the webinars to all 50 states.
The state leaders and champions participating in this evaluation emphasized the value of the monthly webinars in learning how to successfully roll out and bring to scale the SCS. Continuing to expand this network and the webinars will accelerate the ability to identify barriers and address them, respond to challenges, and increase the number of advocates for a credentials-based solution for working learners. It will also create the ability to continually offer fresh material and will allow all of the states to hear from a broader base of state experiences.

Refine the toolkit for employers and education institutions, and build a tool kit for workforce development agencies.
States made heavy use of the tools The Manufacturing Institute developed to assist employers and education institutions in assessing, planning for, and implementing the SCS. The Institute is in the process of organizing these materials onto its website with a customer-oriented approach to improve their ease of access and use. Several of the states commented that workforce development agencies and partners have tremendous potential to help deploy the SCS because of their linkages with the demand side (employers) of the equation and the supply side (workers, learners, and job seekers), but are behind in understanding the unique role they can play.

Continue to serve as facilitator/convener and the primary broker of information to all champions and leaders involved in the project.
All of the states relied upon the Institute to help them plan and, in some cases, facilitate the forums and convening events that brought the broad array of champions, leaders, and partners together. States say they are still struggling with how to engage and convene small and medium-sized employers and would appreciate ideas and support from the Institute on effective engagement strategies for this audience. Finally, as the states move further into implementation, their needs for technical assistance become more specific to each state’s environment, economy, policies, etc., and this requires a more individualized and customized level of support.
## APPENDIX

### List of Interviewees

<table>
<thead>
<tr>
<th>State</th>
<th>Interviewee</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alabama</strong></td>
<td>Ronald W. Boles, Executive Committee Workforce Development, Valley Innovation Alliance</td>
</tr>
<tr>
<td><strong>Arkansas</strong></td>
<td>Glen Fenter, President, Mid-South Community College</td>
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<tr>
<td><strong>Connecticut</strong></td>
<td>Susan H. Palisano, Director of Education &amp; Training Initiative, Connecticut Center for Advanced Technology, Inc.</td>
</tr>
<tr>
<td><strong>Florida</strong></td>
<td>Nancy D. Stephens, CAE, Executive Director, Manufacturers Association of Florida</td>
</tr>
<tr>
<td></td>
<td>Al Stimac, President, Manufacturing Association of Florida, Metalessence</td>
</tr>
<tr>
<td><strong>Illinois</strong></td>
<td>Jim Nelson, Vice President – External Affairs, Illinois Manufacturers’ Association</td>
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<tr>
<td></td>
<td>Maria Coons, Senior Executive to the President, Harper College</td>
</tr>
<tr>
<td><strong>Iowa</strong></td>
<td>Paul Gregoire, Vice President, Global Human Resources Fischer Emerson Process Management</td>
</tr>
<tr>
<td></td>
<td>Kim Didier, Executive Director Des Moines Area Community College Business Resources</td>
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<td></td>
<td>Mike Ralston, President Iowa Association of Business and Industry</td>
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<tr>
<td><strong>Kansas</strong></td>
<td>Blake Flanders Vice President for Workforce Development Kansas Board of Regents</td>
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<tr>
<td><strong>Mississippi</strong></td>
<td>Jay Moon, President and CEO Mississippi Manufacturers Association</td>
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<tr>
<td><strong>Nevada</strong></td>
<td>Ryan D. Costella, Director of Strategic Initiatives, Click Bond, Inc.</td>
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<tr>
<td><strong>New York</strong></td>
<td>Joe Vargo, Executive Director, Partners for Education and Business</td>
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<tr>
<td><strong>Tennessee</strong></td>
<td>Tim L. Spires, President and CEO, Chattanooga Regional Manufacturers Association</td>
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<tr>
<td><strong>Wisconsin</strong></td>
<td>Jim Morgan, Vice President, Wisconsin Manufacturers and Commerce (WMC) Foundation</td>
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<td>Jim Mackey, Education Director, Manufacturing and Engineering Wisconsin Technical College System</td>
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<td><strong>National Resources</strong></td>
<td>Jennifer McNelly, President, The Manufacturing Institute</td>
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<td>Brent Weil, Senior Vice President, for Education and Workforce The Manufacturing Institute</td>
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<td>Audrey Theis President, KeyLinks</td>
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