Report on Phase I Study: Embedding Industry and Professional Certifications within Higher Education

- **Holly Zanville, Strategy Director, Lumina Foundation**
- **Kelly Porter, Strategic Impact and Learning Officer, Lumina Foundation**
- **Evelyn Ganzglass, Co-Director, Connecting Credentials, Corporation for a Skilled Workforce**

January 2017

Executive Summary

The U.S. has a widely-varied education and training system that provides multiple routes to educational and career advancement for people with diverse needs and interests – and a multi-layered marketplace of credentials offered by both educational institutions and credentialing organizations. The types of credentials our system offers include degrees, certificates, apprenticeship-related credentials, certifications awarded by industry and professional associations, licenses to practice awarded by states, badges and other microcredentials, and GED and career-readiness certificates.

Today some 3.3 million Americans between the ages of 25 and 64 hold a job-related certification as their highest postsecondary credential (Lumina Foundation *Strategic Plan 2017-2020*). Given growing interest in these certifications awarded by industry and professional associations, Lumina Foundation and the national Connecting Credentials Initiative conducted a study in spring 2016 to learn more about the practice, policies, and impacts of embedding industry and professional certifications in college and university programs. The study examined questions in five categories:

- Who is involved in these practices?
- Why are these practices being implemented?
- What are certification-embedded practices?
- Where and how are they being implemented?
- What are the benefits, outcomes and return on investment, especially for students, employers, and higher education institutions?

The study was designed in two phases. Phase I surveyed colleges and universities to identify sites that were embedding industry certifications in their courses and programs. Phase II will consist of interviews (phone and on-site) with a group of organizations identified in Phase I for more in-depth study of their practices and policies. Phase II findings will be reported in summer 2017.

Key findings from the 149 respondents in Phase I (80% representing community or technical colleges and the remaining representing four-year institutions, employer groups, and others) include:

- Industry and professional certifications across more than 16 different industry sectors are being embedded in diverse kinds and levels of educational credential programs − from bachelor's degree to dual-enrollment high school-community college programs.

- The practice is especially prevalent in credit-bearing certificate and associate and applied associate degree programs in community and technical colleges; and in credit-bearing and non-credit certificate programs in four-year institutions.

- While the main impetus for embedding certifications in higher education is to enable educational institutions to respond to employer demands, funding, and policy (grant requirements, federal and state policies) are also important drivers of this practice.

- The name most commonly associated with the practice of embedding industry and professional certifications within higher education is "stackable." The terms "competency-based" and "embedded" are also used.

- Respondents from community and technical colleges and employer associations consider embedding industry certifications to be especially relevant to their programs and partnerships. Four-year institutions are less likely to see the practice as relevant.

- There is considerable variation in what educators mean when they say they embed credentials in their programs of study. For example, embedded certifications are being delivered as both a *required* and an *optional* component of college courses. Passing the certification exam may be a requirement of the course of study or as one of many assessments in the course. In other cases, the exam may be used as the capstone assessment of the course, with passage required for attainment of the credential.

- The top three benefits to embedding industry and professional certifications in higher education are 1) students can complete both academic credential and industry/professional-recognized certification, 2) helps keep college/ university curriculum up-to-date with industry standards, and 3) employers get students trained to their specifications or their various tools.

- The top three challenges are: 1) embedded-industry certification in the educational program can be costly for students to pursue, 2) employers in our region don't require or place a high value on certifications, and 3) requires ongoing communication/reassessment in partnership between industry and education.

- For the most part, the cost of taking industry certification exams is borne by the student. At some institutions, the cost is included as part of the tuition and fees for the course. Scholarships, Pell grants and TAACCCT grant funds also are used. In some programs, employers pay the fee for their student/employees.

- Though postsecondary institutions typically track whether students pass certification exams, few collect employment data on students who have completed programs and certifications. Even fewer institutions get feedback from employers on the job readiness of former students, and fewer still obtain information on whether employers must provide training for educational institutions that issue the credential (e.g., to improve teaching of the industry-required portion of the curriculum).

To better understand postsecondary policies and practices that impact the embedding of industry and professional certifications, researchers in Phase II will conduct in-depth interviews with 8-10 organizations including community colleges, technical colleges, four-year institutions, employer-based programs and partnerships, and high school-to-college partnerships. Findings will explore the following areas that could not be easily studied in the Phase I survey instrument:

- *Recruitment*. Recruitment of students into certification programs. Are both employers and education institutions recruiting – and, if so, through separate or collaborative processes?

- *Student profiles.* Demographic data disaggregated by race/ethnicity, age, gender, income.

- *K-12*. Involvement of high schools through dual enrollment programs, pathways, other.

- *Staffing/professional development*. Types of faculty and staff that have been most involved in this set of developments; instructor qualifications needed to teach in an accredited course leading to

certification in some industries; and types of professional development to help faculty and staff understand these practices.

- *Process of stacking credentials*. What is meant by "stackable credential" and how is the certification stackable within certificate or degree programs? Is credit given for attainment of the certification at students' entry into a postsecondary certificate or degree program? Is credit awarded for certification transferrable to another program or institution?

- *Combinations of credentials*. Badges or other microcredentials associated with these practices.

- *Certification exams.* How do educational institutions get information about pass rates? What challenges are preventing educational institutions from getting this information?

- *Funding models*. Types of funding models to include financing of certification exams.

- *Campus-wide impacts*. Impacts on broader campus programs and future campus plans. Does embedding certifications represent a curriculum redesign shift at the college?

- *Policy*. Institutional, state, federal or industry policies related to quality assurance, funding, transfer, etc. that may have changed; challenges educators face in embedding certifications in different kinds of programs of study (e.g., credit versus noncredit certificate programs, applied and transferrable degree programs, high school-to-college pathways, continuing education); and strategies to overcome these challenges.

- *Outcomes.* Data on how students do post-completion; follow-up with students and/or employers; what the college transcript looks like (e.g., is blending of certifications/degrees recognized on the transcript or is there a separate recognition process for certifications).

- *Differences in employer engagement*. How employer engagement in certification partnerships differs by industry sector, postsecondary education context, vendor-specific versus vendor-neutral certifications, and/or by students' employment status.

Background

The U.S. has a widely-varied education and training system – one that provides multiple routes to educational and career advancement for people with diverse needs and interests and features a multi-layered marketplace of credentials offered by educational institutions and other credentialing organizations. The types of credentials offered include:

- *Degrees* awarded by accredited educational institutions for completion of credit-bearing programs of study.
- *Certificates* (credit and noncredit) awarded for course completion by educational institutions, professional associations, community-based organizations, and other accredited and non-accredited organizations.
- *Apprenticeship*-related credentials governed by labor-management partnerships.
- *Certifications* awarded by industry and professional associations.
- *Licenses* to practice awarded by states.
- *Badges* and other *microcredentials* awarded by third-party organizations and by some colleges and universities.
- *GED* and *career-readiness certificates* offered by public, community-based workforce adult education programs and youth-development organizations.

There is growing interest in the certifications awarded by industry and professional associations. Today some 3.3 million Americans between the ages of 25 and 64 hold a job-related certification as their highest postsecondary credential (Lumina Foundation *Strategic Plan 2017-2020*). These certifications are not typically tied to a specific educational program; rather, they are awarded through direct assessment and validation of skills in cooperation with a business, trade association or another industry group.

Some certifications have prerequisites that include taking a specific accredited class taught by qualified instructors, working a minimum period of time at a certain level, and/or successfully completing a work-related task such as getting a specific construction project approved by a local ordinance. Certification bodies may provide industry-validated skill standards and curricula that are aligned with the certification requirements.

The credentials are awarded by a responsible and authorized body that attests that the individual has achieved specific learning outcomes or attained a defined level of knowledge or skill relative to a given standard. In some industries and professions, certification also is tied in a variety of ways to licensing.

There are an increasing number of partnerships between industry and colleges and universities to embed or "stack" industry certifications within higher education courses and/or programs. The practice of embedding certifications in educational programs can allow learners to simultaneously obtain one or more marketable industry/professional certifications, and one or more educational credentials such as degrees, diplomas, and certificates.

Some refer to the practice as *stackable credentials*, *embedded credentials*, or *layered credentials*. Whatever this emerging practice is called, it appears to be growing. Few educators, policymakers or employer groups are knowledgeable about the advances to embed industry certifications into higher education courses and programs; and there are many questions about the outcomes of these practices where they've been implemented.

In spring 2016, Lumina Foundation and the national Connecting Credentials Initiative conducted a study to learn more about the practice, policies and impacts of embedding industry and professional certifications within higher education programs. The study was designed to examine questions in five categories:

- Who is involved in these practices?
- Why are these practices being implemented?
- What are certification-embedded practices?
- Where and how are they being implemented?
- What are the benefits, outcomes and return on investment, especially for students, employers, and higher education institutions?

The study was designed in two phases. Phase I surveyed colleges and universities to identify sites that were embedding industry certifications in their courses and programs. Phase II will consist of interviews with a group of organizations identified in Phase I for more in-depth study of their practices and policies. Phase II findings will be reported in summer 2017.

Methodology

In June 2016, Lumina Foundation and the Corporation for a Skilled Workforce (which manages the national Connecting Credentials initiative) distributed a 17-item online survey through multiple channels including: 1) Connecting Credentials website (www.ConnectingCredentials.org), newsletter, and 100+ co-sponsoring organizations; 2) U.S. Departments of Labor and Education's networks of grantees; 3) National Manufacturing Association's networks; 4) CompTIA's partner colleges; and American Council on Education's newsletter. The survey remained open online for seven weeks. Recipients of the survey were informed that the study would be collecting information about the practices, policies and impacts of embedding industry and professional certifications within higher education programs. Definitions of the following key terms referenced in the survey were also provided as supplemental information:

Educational credential: Documented award by responsible and authorized body that attests that an individual has achieved specific learning outcomes or attained a defined level of knowledge or skill relative to a given standard. Credential in this context is an umbrella term that includes degrees, diplomas, licenses, certificates, badges, and industry/professional certifications.

Educational institutions: Colleges, technical schools, universities, high schools.

Educational programs of study with embedded certification: Allows students to obtain marketable industry/professional or educational credentials simultaneously. Such programs are often implemented in partnership with the certification body that awards certification, which may provide industry-validated skill standards and curricula that are aligned with the certification requirements.

Industry or professional certification: Indicates mastery of, or competency in, specific knowledge, skills or processes that can be measured against a set of accepted standards. These are not typically tied to a specific educational program, but rather awarded through assessment and validation of skills in cooperation with a business, professional organization, trade association or other industry group. After attaining a certification, individuals often must meet ongoing requirements to maintain the currency of the certification. It should be noted, this excludes certificates created and conferred by educational institutions without industry or professional endorsement.

Intermediary organization: Assists employers and higher education institutions to embed industry certifications into the college curricula. They function like a "matchmaker" organization, helping to find the colleges and universities that industry groups may be best matched to work with. Example: National Coalition of Certification Centers (NC3); other certification bodies.

Limitations

The intent of this survey was to glean lessons from a sample of practices underway, not to define the total population of programs. Although this analysis provides a useful window on these emerging practices, there are several limitations to the Phase I study, including the following:

- Although the survey was widely distributed through various channels, with no known statistic on the actual number of industry-embedded programs in higher education in the U.S. and no number for those contacted through our outreach, it is impossible to know what proportion of programs the response rate represents.
    - We're confident that the 149 respondents represent only a portion of the programs being offered.
    - TAACCT grantees may be overrepresented since they comprise nearly half of this sample. Community and technical colleges may be overrepresented as well since they comprise three-fourths of respondents.
    - It is also possible that this sample does not adequately represent four-year institutions, given that only 16 such institutions are represented.
    - Having received responses from educators who indicated their certification-related work involved more than 16 industry sectors, we believe there is satisfactory representation among industry groups. (Note: 16 sectors were specified in the survey and 26 respondents indicated there were "others" they were working with. There are 24 industry sectors in the National Network of Business and Industry Associations, which account for some 75% of jobs in the U.S.)

- Since some respondents were responsible for multiple programs and certifications, it is nearly impossible to tease out differences in partnerships and practices among different industries or occupational sectors. This is an area we plan to study in the Phase II research.

- Some responses were difficult to interpret since the survey instrument did not allow for detailed explanations. We have identified these issues and will explore them during the Phase II study.

Findings

Who is involved in these practices?

There were 149 respondents to the Phase I study, nearly 80% of whom indicated they were representing community or technical colleges. The remaining 20% represented four-year institutions, employer groups and others.

Which type of institution or organization do you represent? (select all that apply)	Response Percentage	Response Total
Community or technical college	79.45 %	116
Four-year college or university	12.33 %	18
Employer group, business, industry, or trade association	7.53 %	11
Other	5.48 %	8

Nearly half of respondents (45%) were associated with Trade Adjustment Assistance Community College and Career Training (TAACCCT) grants. TAACCCT, a federal discretionary grant program administered by the U.S. Department of Labor in partnership with the U.S. Department of Education, 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, are suited for workers who are eligible for training under the Trade Adjustment Assistance for Workers program, and prepare program participants for employment in high-wage, high-skill occupations. Grants have helped build strong partnerships among colleges, the workforce system, employers, and industry groups. To address the program goals, colleges had to consider what credentials would provide both labor market and educational value, how to collect data on the returns from investing in using particular credentials, how to make industry certifications credit-bearing and stackable within certificates and degrees, and what system changes were required to use diverse credentials

Which of the following describe the role you play in partnerships or practices to embed industry and professional certifications within higher education? (select all that apply)	**Response Percentage**	**Response Total**
Director or Evaluator of TAACCCT grant	45.46 %	65
Career and Technical Education Staff	18.18 %	26
Training Director or Staff	11.19 %	16
Faculty in education program	7.69 %	11
Institutional Researcher	6.29 %	9
Industry and Trade Association Staff	2.79%	4
Human Resources Director or Staff	0.70 %	1
Other	30%	43

When asked if respondents have been associated with a TAACCCT grant project that has been working on embedding industry certification(s) into a higher education institution, more than two-thirds (70%) indicated they were current or former TAACCCT grantees – and more than 90% of these were from community or technical colleges. The significant response from TAACCCT grantees provides evidence that community colleges used at least some grant funds to embed industry certifications in their programs of study.

Have you been associated with a federal-funded TAACCCT grant project that has been working on embedding industry certification(s) into a higher education institution?	**Response Percent**	**Response Total**
Yes, and am currently associated with such a project	55.94 %	80
No	24.48 %	35
Yes, in the past	14.69 %	21
Do not know	4.90 %	7

Nearly all respondents (90%) indicated they are involved in a partnership or practice to embed an industry certification into a program of study at a higher education institution. For those not involved, reasons include: “we are in the process of considering supporting or implementing this practice” (5 responses),

and “this practice is not relevant to the programs this institution delivers or partnerships my organization conducts” (2 responses).

Are you currently involved in any partnerships or practices to embed an industry certification into a program of study at a higher education institution?	Response Percentage	Response Total
Yes	89.66 %	130
No	10.34 %	15

Why not? (select all that apply)	Response Percent	Response Total
Other	57.14 %	8
We are in the process of considering supporting or implementing this practice	35.71 %	5
This practice is not relevant to the programs this institution delivers or partnerships my organization conducts	14.29 %	2

Respondents were asked if an intermediary organization is part of the partnership implementing the industry or professional certification program(s) with the higher education institution(s). An intermediary organization was defined as an organization that assists employers and higher education institutions to embed industry certifications into the college curricula. They function like a “matchmaker” organization, helping to find the colleges and universities that industry groups may be best matched to work with (e.g., National Coalition of Certification Centers – NC3; other certification bodies). Nearly two-thirds of respondents (64%) indicated that an intermediary organization was not part of their partnership, although 23% indicated it was and 13% did not know.

Is an intermediary organization part of this partnership?	Response Percentage	Response Total
No	63.79 %	74
Yes	23.28 %	27
I don't know	12.93 %	15

Why are these practices being implemented?

Respondents were asked why they think institutions of higher education are embedding industry or professional certifications into their programs. The top choice (81%) was the call by industry that students will be more agile and competent as workers if they combine their education with industry certification(s). Other top choices, in order (cited by 49.7%, 49%, and 41%) were employer dissatisfaction with skills, requirements by federal programs such as TAACCCT, and federal and state policies.

Why do you think institutions of higher education are embedding industry or professional certifications into their programs? (select all that apply)	Response Percentage	Response Total
General call by industry that students will be more agile and competent as workers if they combine academic achievement (degrees, certificates and other credentials awarded by colleges/universities) with the certifications industries recognize and require in many instances for entry and/or advancement in employment	81.38 %	118
Employer dissatisfaction with skills	49.66 %	72

Requirements by federal grant programs like TAACCCT	48.97 %	71
Federal and state policies (e.g., Workforce Innovation and Opportunity Act, performance-based funding)	40.69 %	59
Recognition that certifications are transferrable to other countries	17.93 %	26
Other	20.69 %	30

What are certification-embedded practices?

Respondents were asked what name(s) they most associate with the practice of embedding industry and professional certifications within higher education. The top choices were stackable (78%), competency-based (59%), and embedded (52%).

What name(s) do you most associate with the practice of embedding industry and professional certifications within higher education? (select all that apply)	**Response Percentage**	**Response Total**
Stackable	77.93 %	113
Competency-based	58.62 %	85
Embedded	52.41 %	76
Contextualized	20.00 %	29
Blended	11.72 %	17
Layered	7.59 %	11
Other	8.97 %	13

Respondents were asked to describe how the certification is tied to the educational curriculum. Nearly two-thirds (64%) indicated the curriculum is tied to the skill standards for the certification; and 52% indicated the curriculum is not tied to skill standards associated with a company or vendor-specific certification. *Vendor-specific certifications* include commonly provided programs in Microsoft products as well as ones tied to the use of Snap-on Tools products and Chrysler automobile service requirements. An example of a *vendor-neutral certification* is the CompTIA A+ certification, which validates the latest foundation-level knowledge and skills needed by today's computer support professionals regardless of specific system with which they are working. The question regarding vendor-specific and vendor-neutral certifications may be important because of the potential for different levels and kinds of employer engagement with the two types of certification, and potential education policy or practice discomfort with embedding vendor-specific skill standards and certification exams in publicly-funded programs.

Which of the following best describe your industry/professional-embedded certification program(s)? Since you may be involved with more than one program, select all that apply.	**Response Percentage**	**Response Total**
A vendor-specific certification where curriculum IS tied to skill standards underlying a company or vendor-specific certification (e.g., Microsoft, Snap-on certifications)	63.49 %	80
A vendor-neutral certification where curriculum IS NOT tied to skill standards associated with a company or vendor-specific certification (e.g., CompTIA certification in IT)	52.38 %	66
Other	15.87 %	20

Respondents were asked to describe the academic (educational) credential(s) the student may receive through the industry and professional-embedded certification program. The top choices were credit-bearing certificate (68%), associate degree (55%), applied associate degree (54%), non-credit and credit certificates (56%), and customized industry training program (39%). These distinctions are important because each type of program operates under different rules and with different institutional relationships.

Which best describes the credential(s) the student may receive through the industry/professional-embedded certification program? Since you may be involved with more than one program, select all that apply.	Response Percentage	Response Total
Credit-bearing certificate	68.25 %	86
Non-credit and credit certificates	55.56 %	70
Associate degree	54.76 %	69
Applied associate degree	53.97 %	68
Customized industry training program	38.89 %	49
Technical diploma	18.25 %	23
High school diploma (dual enrollment programs)	15.08 %	19
Applied baccalaureate degree	9.52 %	12
Traditional baccalaureate degree	7.94 %	10
Other	8.73 %	11

Where and how are they being implemented?

Respondents were asked to describe the ways in which industry and professional certification operates in the educational program(s) in which they are involved. The top choices were “skills required to earn the certification are aligned and delivered concurrently” (77%), and “embedded industry certification is delivered as an additional option, not a requirement as the student attains college credential (63%).

Which of the following best describe the ways in which the industry/professional certification operates in the education program? Since you may be involved with more than one program, select all that apply.	Response Percentage	Response Total
The skills required to earn the certification are aligned and delivered concurrently	76.98 %	97
The embedded industry certification is delivered as an additional option, NOT a requirement as the student attains college credential	62.70 %	79
The industry certification is NOT an option. It is embedded as a requirement in the course of study. It may be used as one of many assessments in the course. Passing this assessment is NOT required to receive the higher education credential	39.68 %	50
The embedded industry certification is NOT an option--it is embedded as a requirement in the course of study. It is used as the final/capstone assessment. Passing this assessment is REQUIRED to receive the higher education credential	20.63 %	26
Other	8.73 %	11

Respondents were asked to identify which programs of study their partnership affects or their program is currently offering. The programs most frequently identified were manufacturing and advanced manufacturing (68%), welding (46%), information technology (37%), health care (nursing, allied health)

(32%), automotive (25%), energy (20%), and transportation (19%). There were programs identified in all 16 industry sectors included in the survey, and others identified in addition to the 16.

Which programs of study is your partnership impacting or is your program currently offering? Since you may be involved with more than one program, select all that apply.	Response Percentage	Response Total
Manufacturing, Advanced Manufacturing	68.25 %	86
Welding	46.03 %	58
Information Technology (IT)	36.51 %	46
Health Care (Nursing, Allied Health)	31.75 %	40
Automotive	24.60 %	31
Energy	19.84 %	25
Transportation	19.05 %	24
Construction	18.25 %	23
Management/Business	15.87 %	20
Heating, Air Conditioning	15.87 %	20
Horticulture	3.17 %	4
Hospitality	9.52 %	12
Aerospace; Aviation	12.70 %	16
Public Safety	7.14 %	9
Finance Services	5.56 %	7
Retail	3.97 %	5
Other	20.63 %	26

Respondents were asked who covers the cost for the industry and professional certification exam. More than two-thirds (69%) indicated the student pays the cost to take the exam; and 48% indicated the higher education institution includes the cost as part of the tuition/fees for the program. Nearly one-third of respondents (31%) indicated that employers cover the cost if the student is employed with them. During Phase 2 research, this question will be explored further regarding the impact of this decision on students, the role employers play in paying for certification exams for incumbent workers, and how federal and state financial aid rules influence this decision.

Who covers the cost for the industry/professional certification exam? Since you may be involved with more than one program, select all that apply.	Response Percent	Response Total
Student pays the cost to take the exam	68.60 %	83
Higher education institution includes the cost as part of the tuition/fees for the program	47.93 %	58
Employer covers the cost for student to take the industry certification exam if the student is employed	31.40 %	38
Scholarships	23.97 %	29
Pell	13.22 %	16

Employer covers the cost if student is not employed	4.13 %	5
Other	22.31 %	27

Respondents were asked who receives the results from students' exams for the embedded industry and professional certification. Most indicated that students (89%) and the higher education institutions (65%) received the results. During Phase 2 research, we will explore the circumstances that enable and prohibit this information to be shared between the certification provider and educational institutions.

Who receives the results from students' exams for embedded industry/professional certification programs? (select all that apply)	Response Percentage	Response Total
Student	89.26 %	108
Higher education institution	65.29 %	79
Employer	16.53 %	20
Workforce system partner or intermediary	16.53 %	20
Other	11.57 %	14

What are the benefits, outcomes and return on investment, especially for students, employers and higher education institutions?

Respondents were asked to identify the top three benefits of embedding industry and professional certifications into higher education from among seven choices. The top choice (86%) was so that "students can complete both academic credential and industry/professional-recognized certification(s)." Other top choices were it "helps keep college/university curriculum up-to-date with industry standards" (63%) and "employers get students trained to their specifications or their various tools" (56%).

Which of the following do you think are the top three benefits of embedding industry and professional certifications into higher education? (select up to three)	Response Percentage	Response Total
Students can complete both academic credential (degree, certificate) and industry/professional-recognized certification(s)	86.21 %	100
Helps keep college/university curriculum up-to-date with industry standards	62.93 %	73
Employers get students trained to their specifications or their various tools	56.03 %	65
Increases faculty understanding of employer/industry sector needs for specific skills	30.17 %	35
Educational institution gains better understanding of local labor market demands	27.59 %	32
Increases student completion of the academic program in which the certification is embedded	24.14 %	28
Other	4.31 %	5

Respondents were asked to identify the top three challenges with embedding industry and professional certifications into higher education from among seven choices. The top three challenges were "embedded-industry certification in the educational program can be costly for students to pursue" (57%), "employers in our region don't require or place a high value on certifications" (54%), and "requires ongoing communication/reassessment in partnership between industry and education" (54%).

Which of the following do you think are the top three challenges with embedding industry and professional certifications into higher education? (select up to three)	Response Percentage	Response Total
Embedded-industry certification in the educational program can be costly for students to pursue	57.76 %	67
Employers in our region don't require or place a high value on certifications	54.31 %	63
Requires ongoing communication/reassessment in partnership between industry and education	53.45 %	62
Many industry certifications are too narrow or skill-based, which limits usefulness to students	34.48 %	40
Instructors are not certified to teach students preparing for the certification exam	32.76 %	38
Unsure of validity of skill standards underlying certifications or the assessments used	19.83 %	23
Other	12.93 %	15

Respondents were asked to indicate to what extent they obtain various outcomes information from the industry and professional-embedded certifications. About three-fourths receive employment data from some (43%) or all programs (30%). The great majority receive feedback from employers on the extent to which the employee who received the certification is prepared for the job (70% from some programs) and 20% from all programs). Slightly less than half of respondents obtain information on the extent to which employers must provide training for the education institution issuing the credential (37% from some programs and 10% from all programs).

To what extent do you obtain the following outcomes information from industry/professional-embedded-industry certifications?	Yes, from all programs	Yes, from some	None	Response total
Employment data	29.5% 33	42.9% 48	27.7% 31	112
Feedback from employers on extent to which employee who received industry/professional certification is prepared for the job	19.8% 23	69.8% 81	10.3% 12	116
Extent to which employers must provide training for education institution issuing credential (e.g., to improve teaching of industry-required portion of the curriculum)	10.1% 11	36.7% 40	53.2% 58	109

Summary

The Phase I study cross-tabulated the findings by a number of different variables. The two variables that were most telling were: 1) differences by two- and four-year institution, and 2) differences by industry sector. The following items are key takeaways from the study, incorporating differences by type of institution and industry sector.

- Industry and professional certifications across a broad range of industry sectors (more than 16 sectors) are being embedded in diverse kinds and levels of educational credential programs − from bachelor's degree to dual-enrollment high school-to-community college programs.

- The practice is especially prevalent in credit-bearing certificate and associate and applied associate degree programs in community and technical colleges; and in credit-bearing and non-credit certificate programs in four-year institutions.

- The main impetus for embedding certifications in higher education is that it enables educational institutions to respond to employer demands.

- Funding and policy have encouraged the practice of embedding industry and professional certifications in higher education programs. Two-thirds of TAACCCT grantees cited grant requirements as a driver for this practice, and close to half cited federal and state policies as drivers.

- Not everyone is getting on the bandwagon. More than two-thirds of respondents from four-year institutions indicated that embedding certifications is irrelevant to the programs and partnerships conducted by their institutions. In contrast, no community and technical college or employer association respondents considered embedding certifications irrelevant.

- There is considerable variation in what educators mean when they say that they embed credentials in their programs of study. For example, embedded certifications are being delivered as both a *required* and an *optional* component of college courses. Passing the certification exam may be a requirement of the course of study or as one of many assessments in the course. In other cases, the exam may be used as the capstone assessment of the course, with passage required for attainment of the credential.

- The prevalence of industry-education partnerships to support the practice of embedding certifications differs by industry in two- and four-year institutions. While 90% of respondents and all TAACCCT grantee respondents said they were involved in current partnerships or practices to embed certifications, only 70% of four-year institutions report current partnerships.

- More than two-thirds (70%) of community and technical college respondents and half of respondents from four-year institutions said that no intermediary was involved in their partnership. The intermediary organizations mentioned as participating in such partnerships include NC3, National Institute of Metalworking Skills (NIMS), the Workforce Credentials Coalition, and a variety of national and state industry and professional associations.

- In four-year institutions, partnerships to embed credentials are most prevalent in management and business, healthcare, public safety, and information technology programs. In two-year institutions, such partnerships are most prevalent in manufacturing and advanced manufacturing, welding, information technology, and healthcare.

- Both vendor-specific and vendor-neutral certifications are being embedded (vendor-specific certifications are based on skill standards associated with a specific company or vendor). Perhaps because of the different industry mix in their institutions, the practice of embedding vendor-specific certifications is much more prevalent in community and technical colleges than in four-year institutions (67% to 38%).

- For the most part, the cost of taking certification exams is borne by students. About 90% of respondents from four-year institutions and 70% of community and technical college respondents report that students pay the exam fee. About two-thirds of four-year respondents and nearly half of community and technical college respondents report that the cost of the exam is included as part of the tuition and fees for the course. About a third of respondents said employers pay the fee for their student/employees. Scholarships, Pell grants and TAACCCT grant funds also are used.

- The main impetus for embedding certifications in higher education is that it enables educational institutions to respond to employer demands. The top three benefits are: 1) students can complete both academic credential and industry/professional-recognized certification, 2) helps keep college/university curriculum up-to-date with industry standards, and 3) employers get students trained to their specifications or their various tools.

- The perceived challenges to this practice differ significantly among respondent groups. While close to two-thirds of community and technical college respondents think that the cost to students of embedded certifications is one of the top three challenges, only a quarter of four-year institution respondents cited this as a major challenge. More than half of community and technical college respondents and half of employer, business and trade association respondents think a top challenge is that employers in the region don't require or place a high value on certifications. In contrast, just 13% of four-year institutional respondents think this is a major challenge. This, too, may reflect the different professions and industries involved. For example, three-quarters of business/industry respondents rate "requires ongoing communication" as a top challenge, whereas half of educators think this is a top challenge. A quarter of business/industry respondents and close to a third of community and technical college respondents think that a top challenge is that instructors aren't certified to teach students preparing for the certification exam. In contrast, just 13% of respondents from four-year institutions think this is a major challenge. Half of four-year respondents, a third of two-year respondents, and a quarter of business/industry respondents think that many certifications are too narrow or skill-based to be useful to students. Finally, close to a quarter of community and technical college respondents, just 13% of four-year respondents, and no business/industry respondents question the validity of the skill standards underlying the certifications or the assessments used.

- Postsecondary educational institutions are tracking the results of students who obtain certifications. Two-thirds of respondents said the postsecondary educational institution gets information on whether the student passed the certification exam or not. About a third of respondents from community and technical colleges get employment data on students who obtain certifications in all their programs; another 40% get this information for some of their programs; and 70% of respondents from four-year institutions said that they get employment data on students in some of their programs. More than two-thirds of respondents from two- and four-year institutions said that they get feedback from employers in some but not all programs on the extent to which employees who received an industry/professional certification are prepared for the job. About a third get information on the extent to which employers must provide training for educational institutions issuing the credential (e.g., to improve teaching of the industry-required portion of the curriculum).

Next Steps

Respondents were asked to identify which of 12 elements described below they could showcase if their organization or partnership was selected for more in-depth study in Phase II through an interview process:

1. Types of faculty and staff that have been most involved in this set of developments.
2. Involvement of high schools (dual enrollment programs with high schools, pathways).
3. Recruitment processes. (Are employers recruiting and, if so, through separate processes?)
4. Future plans. (Does embedding represent a curriculum redesign shift at the college?)
5. Types of professional development to help faculty and staff understand this practice.
6. Impacts on broader campus programs.
7. Funding model to include financing of certification exams.

8. Student demographic data (disaggregated by race/ethnicity, age, gender, and income).
9. Policies that may have changed (state, institutional or industry).
10. Badges or other microcredentials that may be associated with these practices.
11. Outcomes data on how students are doing post-graduation; follow up with students and/or employers.
12. What the college transcript looks like. (Is blending of certifications/degrees recognized on the transcript, or is there a separate recognition process for certifications?)

Researchers in Phase II will conduct interviews with 8-10 organizations to explore these issues and others raised by findings in the Phase I study. The organizations will include community colleges, technical colleges, four-year institutions, employer-based programs and partnerships, and high school-to-college partnerships. The aim of this research will be to increase knowledge about the practices, policies and impacts of industry and professional certifications being embedded in educational programs. The Phase II report is expected to be distributed in summer 2017.

Lumina Foundation and 112 co-sponsoring organizations in the Connecting Credentials initiative are calling for ways to transform our nation's highly diverse and fragmented credentialing system into one that is student-centered and learning-based. Change is needed for several reasons, to: ensure educational quality; increase access; better align the work of industry, education and certification/licensure agencies; multiply the benefits of increased attainment; reduce social inequity; and foster individual progress that results in market-valued credentials.

The Connecting Credentials Initiative is supported by Lumina Foundation and managed by the Corporation for a Skilled Workforce
www.connectingcredentials.org

Lumina Foundation is an independent, private foundation in Indianapolis that is committed to making opportunities for learning beyond high school available to all. We envision a system that is easy to navigate, delivers fair results, and meets the nation's need for talent through a broad range of credentials. Our goal is to prepare people for informed citizenship and for success in a global economy. For more information: www.luminafoundation.org

Corporation for a Skilled Workforce is a national nonprofit that partners with government, business, and community leaders to support the creation of good jobs and the highly skilled workers to fill them. We help communities innovate so that they can compete. We help businesses cultivate talent so that they can grow. And we help people learn so that they can find good jobs—or create their own. For more than 25 years, we have been an effective catalyst for change. We identify opportunities for innovation in work and learning and provoke transformation in policy and practice. We have worked with dozens of workforce investment boards, state workforce agencies, community-based organizations, and colleges to create lasting impact through their collaborative activities.For more information: www.skilledwork.org