

EMBEDDING CERTIFICATIONS INTO BACHELOR'S DEGREES

CERTIFICATION- DEGREE PATHWAYS PROJECT



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ACTIVITIES

Workcred, in partnership with the Association of Public and Land-grant Universities (APLU) and its permanent partner, the Coalition of Urban Serving Universities (USU), and the University Professional and Continuing Education Association (UPCEA), identified opportunities, challenges, and practical examples associated with integrating high-quality, industry certifications into bachelor's degree programs in order to create more opportunities for students to earn credentials with labor-market value.

This project's main activities included planning and facilitating convenings, outreach and follow-up with convening participants, and research and synthesis of information from the first two activities. The analysis from the convenings is outlined in the outcomes and discussion sections of this report.

CONVENINGS

To identify examples, opportunities, and challenges associated with integrating industry certifications into bachelor's degrees, the project team hosted four two-day convenings. Three of the convenings focused on industry sectors—healthcare, cybersecurity, and manufacturing—and one focused on the liberal arts.¹ The convenings also included a discussion of cross-sector skills, such as project management or translation.²

1 A fifth convening, focused on the hospitality industry, was planned for March 26-27, 2020, but was canceled due to the COVID-19 pandemic. Universities and certification bodies that expressed interest in participating in that convening have been included in future project communications.

2 See [“Appendix A: Convening Agendas and Summaries”](#) for more details on each convening.

Because this project has national implications, the project team sought to include representatives from four-year universities, certification bodies, and a few key employers from across the country, and the convenings were held in different regions to make participating more convenient and economical since participants funded their own attendance. The project team observed an eagerness and willingness to engage in the project by both certification bodies and universities—with more than 150 participants attending the four convenings, and many representatives were keen to attend more than one convening.³

Each convening highlighted different models of partnerships between certification bodies and universities, which served as both examples for convening participants and points of discussion. Details on a select few of the partnerships that were identified both within and outside of the convenings are detailed later in the report.

TIMELINE



³ See “Appendix B: Organizations Represented at Project Convenings” for the full list of attending organizations.

OUTREACH AND FOLLOW UP

To ensure an equitable and inclusive participation, Workcred invited executive directors and directors of certification that represented certification bodies based on selected criteria—whether their certification(s) could be aligned at the cognitive content level of a bachelor’s degree, whether the organization participates in Workcred’s Credentialing Body Advisory Council, and if they are accredited by a third-party.⁴ For purposes of this project, accreditation served as a proxy for the industry value of the certification. Select employers in industries related to the focus of a convening were also invited to participate.



For the university representatives, APLU, USU, and UPCEA project team members identified member universities based on noted expertise or focus on industry partnerships, previous work in credential pathways, interest in the project, and student enrollment that represents diverse, traditional, and historically marginalized, non-traditional populations. Invitations were sent to presidents and chancellors asking them to nominate teams of one to three faculty and administrators representing both the credit and continuing and professional education

4 For more information on Workcred’s Credentialing Body Advisory Council, visit <https://www.workcred.org/About-Workcred/Board-and-Councils.aspx>; Either the ANSI National Accreditation Board (ANAB) or the National Commission for Certifying Agencies (NCCA) accredited the certification bodies selected to participate in these convenings. Both ANAB and NCCA accredit personnel certification bodies using a national and/or international standard.

divisions of the university to participate in the convenings. Having support from senior leadership in this way proved critical to the discussions.

Prior to the first convening, the project team conducted individual interviews with all invitees to introduce them to the project, gauge university representatives' knowledge of the certification development process or certification body representatives' knowledge of the curriculum development process, gather information about existing partnerships, and explore what the participants wanted to gain from attending the convenings.⁵ Prior to the remaining convenings, project team members had structured conversations with individuals involved in partnerships that were targeted to highlight as part of this work, and briefed interested representatives from certification bodies, universities, and host locations. After each of the convenings, the project team followed up with both the individuals who participated in the convenings and others who reached out to team members after learning about the project. Through this follow-up, the project team identified universities and certification bodies that were also interested in joining efforts to align and embed certifications into baccalaureate degrees, beyond just those who participated in the convenings.

Leveraging the collective memberships and relationships of the project team in these ways ensured that a diverse network of universities and certification bodies participated in the convenings. Furthermore, by collaborating across different parts of universities—both degree and professional and continuing education departments—and among accredited certification bodies, participants were better able to learn from each other and share practices that will allow students to earn multiple credentials that have value in the labor market. In particular, a significant percentage of participants are USU members, which are public urban research universities that enroll more than 1.1 million students—43 percent of whom receive Pell grants, 52 percent of whom represent students of color, and 20 percent of whom are adult learners. Furthermore, by including a diverse set of participants, including representatives from universities that enroll large numbers of underrepresented and underserved populations, future pilot programs resulting from this project will be sensitive to the postsecondary attainment inequities these populations often encounter.

5 See [“Appendix C: Interview Questions Prior to Healthcare Convening”](#) for the interview questions and [“Appendix D: Pre-Convening Materials”](#) for the outcomes and themes of the interviews.

OUTCOMES

Through this project, the project team expected to accomplish the following outcomes: (1) participants, certification bodies, and the higher education community will gain knowledge and better understand the current landscape of relationships between universities and certification bodies, and among credentials; (2) foster an emerging community of practice between universities and certification bodies; and (3) synthesize convening outcomes and themes into a framework that identifies certification-degree pathway examples, challenges, and opportunities associated with building these pathways. All three outcomes were achieved as described in the following results section.

Multiple survey instruments, as well as follow-up conversations, were used to measure and assess the progress against achieving these outcomes. The surveys and follow-up conversations were conducted with all prospective convening participants to assess the percentage of respondents who:

- » increased their contact/dialogue with other participants;
- » reported improving their understanding of the curriculum development or the certification exam process;
- » reported a change in perceptions; and
- » were willing to commit to a possible phase II pilot to test models of certification-degree pathways.

In addition, the project team disseminated this work through multiple communication channels, including articles, blog posts, conference presentations, and other updates describing this project and noting examples of universities or certification bodies that are collaborating

to align their programs.⁶ The project team has received tremendous feedback on the articles and other activities from participants, as well as many additional certification bodies and universities.

RESULTS

OUTCOME 1: PARTICIPANTS, CERTIFICATION BODIES, AND THE HIGHER EDUCATION COMMUNITY WILL GAIN KNOWLEDGE AND BETTER UNDERSTAND THE CURRENT LANDSCAPE OF RELATIONSHIPS BETWEEN UNIVERSITIES AND CERTIFICATION BODIES, AND AMONG CREDENTIALS.

Initial interviews conducted in advance of the first convening revealed a lack of understanding from participants about each other, as well as the variety of credentials available. To help alleviate this confusion and ensure that everyone had a similar knowledge base, the project team developed a set of materials that were distributed prior to the convenings.⁷ The materials were created to help participants better engage during the convenings, set the stage for productive discussions, and provide information on the project's goals and differences among various types of credentials, with a focus on certifications. These materials were also updated between convenings in order to improve their content and tailor them to the next convening's attendees. Many participants thanked us for providing this information and informed us that the explanations of credential terminology and the different types of credentials were extremely helpful in understanding the structure, development, accreditation, and assessment processes between degrees, certificates, certifications, and licenses.

Furthermore, the conversations around credential terminology resulted in the creation of two additional products. Workcred created a video to explain the differences among certificates, certifications, and licenses, and the best uses for each.⁸ In addition, to assist universities in determining which certifications have quality, the project team developed a list of questions that universities can ask certification bodies to guide the conversation.⁹ These questions touch on such topics as the certification's purpose, the stakeholders involved in building the certification, eligibility requirements, and demand by employers.

6 See ["Appendix E: Communications and Outreach Activities"](#) for the list of all the communications efforts throughout the project.

7 See ["Appendix D: Pre-Convening Materials"](#) for the full set of materials that were distributed prior to the convenings.

8 View the video, ["Differing Types of Workplace Credentials."](#)

9 See ["Appendix F: Questions Universities Can Ask Certification Bodies to Assess Quality of Certifications"](#) for the full list of questions.

Across all of the convenings, the information received through the use of surveys showed an increased understanding by attendees of the university curriculum development process and the certification exam development process after attending a convening. In particular, very few—and sometimes no—respondents indicated that they still did not understand these processes.¹⁰ Additionally, changes from pre-convening survey responses to post-convening responses for other questions strongly suggest a more nuanced understanding of the value and ability of partnerships between certification bodies and universities. For example, there were some significant shifts in the number of respondents who selected it was “very possible” to align university curriculum and certification exam content, reflecting a change in viewpoint due to participation in the convenings. Fostering a better understanding and actively using a common language about credentials (see Figure 1: Creating a Common Language) was critical to facilitating constructive conversations, and ultimately served to strengthen the relationship between the university and certification body attendees.

Figure 1: Creating a Common Language



OUTCOME 2: FOSTER AN EMERGING COMMUNITY OF PRACTICE BETWEEN UNIVERSITIES AND CERTIFICATION BODIES.

Through multiple conversations with project team members, many participants noted that they found the discussions at the convenings to be incredibly relevant and valuable. Further, the convenings allowed both certification bodies and university representatives to network with other individuals interested in developing certification-degree pathways,

¹⁰ See “Appendix G: Pre- and Post-Convening Survey Data” for the results of the surveys.

which they noted was lacking in the existing career pathway ecosystem. This value was also notable to the project team throughout the convenings. Participants were highly engaged in the panel discussions, small group discussions, and individual exercises during the convenings. In particular, when discussing the challenges that many face in aligning or embedding certifications into four-year degree programs, participants came up with various approaches to addressing these challenges. While the approaches were often unique to that particular organization, the conversations helped to reveal that there are similarities in which different academic disciplines and industry sectors can begin working together to create such pathways. The discussions at the convenings reflected a strong interest in learning from others how to model opportunities that might work for them or others in similar circumstances.

Additionally, universities were very willing to host the convenings on their campuses, provide meeting rooms and catering options, coordinate with planning, and even have leaders welcome the participants.¹¹ This willingness to host and involve leadership within their universities strongly suggests the desire to be involved in a community working toward certification-degree pathways. Furthermore, individuals from universities and certification bodies were very interested in participating in panels or otherwise sharing information about their programs and partnerships, reflecting the desire to foster, build, and participate in a community around aligning and embedding certifications and baccalaureate degrees.

Participants also continued these conversations on their campuses and within their organizations after the convenings. This is most readily evidenced by the participants who inquired about sending representatives to attend another convening, or involving multiple disciplines, departments, or colleagues within a university or certification body. Follow-up calls and meetings with these individuals have uniformly echoed the desire to foster this emerging community of practice between representatives of universities and certification bodies around certification-degree pathways.

OUTCOME 3: SYNTHESIZE CONVENING OUTCOMES AND THEMES INTO A FRAMEWORK THAT IDENTIFIES CERTIFICATION-DEGREE PATHWAY EXAMPLES, CHALLENGES, AND OPPORTUNITIES ASSOCIATED WITH BUILDING THESE PATHWAYS.

By engaging universities, certification bodies, and employers throughout the project, the project team supported meaningful dialogue on expanding the relationships between certifications and four-year degree programs. Certifications can be used to enhance a college education with specific skills needed by employers, resulting in students earning a

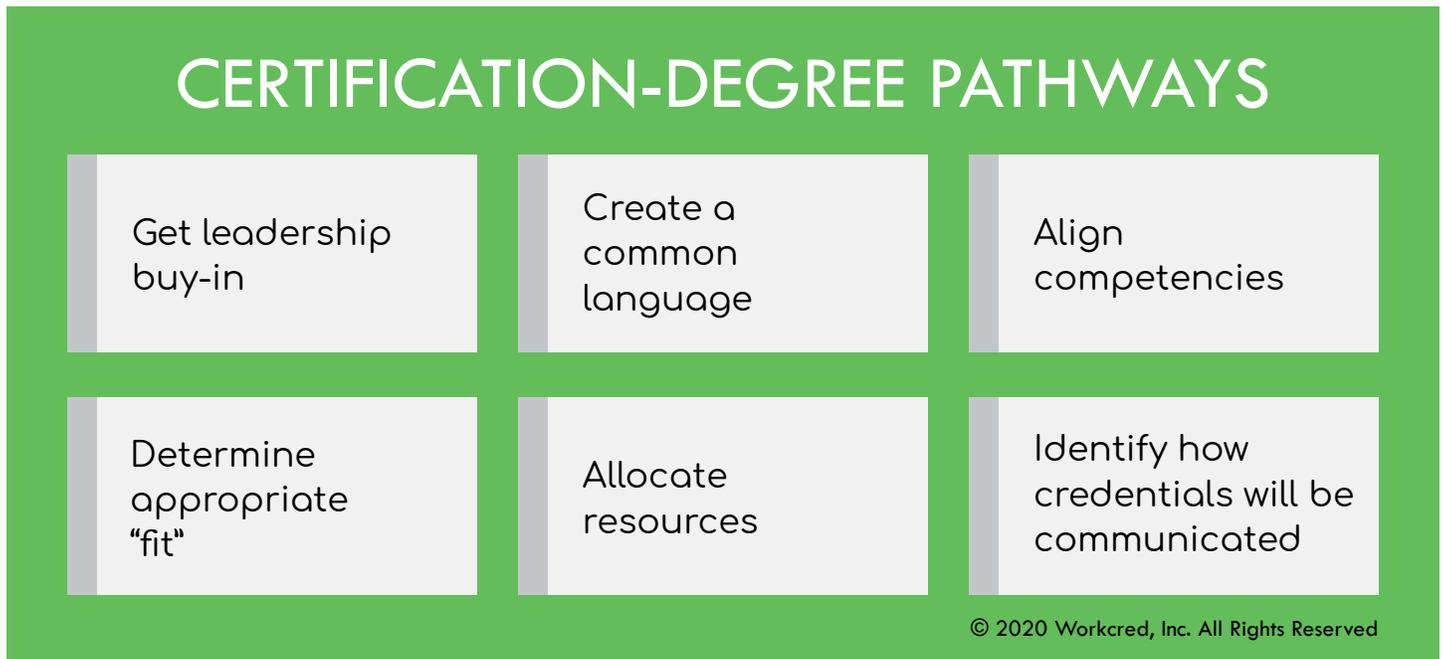
¹¹ This includes Florida International University in Miami which was selected as the site for the project's fifth convening focused on the hospitality industry, later cancelled due to the COVID-19 pandemic.

certification while pursuing their degree or earning a certification at the end of their degree program, achieving a more comprehensive education. Certifications within degrees may increase students' chances for summer employment and work-based learning experiences during the academic year, as well as lead to promotions and wage increases prior to, or as students complete, their degree. Certifications also set students up for life-long learning, as certifications are unique credentials in that they require a process of renewal, referred to as recertification, in order to remain valid.

To this end, the project team has created a framework in support of developing and scaling these pathways (see Figure 2 : Certification-Degree Pathways Framework).

Beyond creating this framework, the project team has garnered significant interest from participants to continue developing and testing the framework through a nascent community of practice around this work, as detailed earlier in the report. This new community now shares a common understanding of certifications and degrees, including how these two credentials can complement each other. The community brings together stakeholders from different industries, geographies, and organizations to find solutions and models—beyond those presented at the convenings—tailored to the particular needs of students. As mentioned previously, many participants have asked to be updated regularly on the project, and to be involved in future phases, reflecting the desire to continue in the pursuit of certification-degree pathways.¹²

Figure 2: Certification-Degree Pathways Framework



¹² See "[Appendix H: Phase II Interest](#)" for the representatives' aggregate input to Phase II.

ADDITIONAL PROJECT OUTCOMES

DEVELOPING VALUE PROPOSITIONS

During each of the convenings, participants' discussions organically gravitated to the 'why' of creating certification-degree pathways. Naturally, attendees began articulating the value propositions for students, certification bodies, universities, employers, accreditors, and society as a whole to help answer this question. These in-depth discussions around value were both compelling and rich in details, and went beyond the initial thinking included in the project proposal. As a result, the project team felt it was important to highlight these observations and interpretations on the value to specific audiences of creating certification-degree pathways as an outcome of the project. These statements both validate the project and this work overall.¹³

DISCOVERING PARTNERSHIP EXAMPLES

While not articulated as a goal in the project proposal, the project team believed that models of partnerships between universities and certifications bodies would emerge through the convenings, discussions, and additional research. These examples inspired participants to think about the different opportunities that exist to align and embed certifications and in bachelor's degree programs. This initially unstated, yet highly anticipated, outcome proved true as several examples emerged throughout this project, as described on the following pages.

¹³ See "[Appendix I: Value Proposition](#)" for the full list of value statements developed during the project.

VALUE PROPOSITIONS

STUDENTS

- » Gain both a broad-based education and industry-specific skills that hiring managers seek in new hires.
- » Expand the possibility of students' career opportunities and awareness of career and credential pathways.

CERTIFICATION BODIES

- » Increase awareness and attainment of their certification as well as improve understanding of how the certification relates to a variety of career and credential pathways.
- » Better understand how a broad-based education afforded by a bachelor's degree contributes to the success of industry professionals who hold both degrees and certifications.

UNIVERSITIES/HIGHER EDUCATION

- » Improve responsiveness of universities to the needs of students and employers.
- » Recruit new students by developing more opportunities to count certifications for academic credit toward a bachelor's degree.

HEALTHCARE

In healthcare, many certification programs have education and/or work experience prerequisites. In addition, many pre-professional bachelor's degree programs have a very structured and rigorous curriculum. As a result, there are not many existing models or partnerships to align and embed voluntary certifications into existing healthcare degree programs.

However, one example the project uncovered is from West Virginia University (WVU), in which they have identified multiple certifications that align to a new bachelor's degree program in health and well-being, for students interested in health science related careers. This degree program offers students two different pathways to accommodate their career aspirations—(1) a bachelor of science (BS) degree for students planning to pursue a professional degree in health sciences (such as athletic training, occupational therapy, allied health professions, or nursing); or (2) a bachelor of arts (BA) degree for students interested in careers in community health and well-being. Students enrolled in the BA degree have the opportunity to tailor their program to their career goals by selecting one of four areas of emphasis—adventure and outdoor learning, aquatic physical activity, fitness, or recreational sport. Students who pursue the BS degree also have an opportunity to earn certifications if they decide to add an area of emphasis on therapeutic exercise and rehabilitation.

Certifications that students can earn within this new degree program include the ACE Personal Trainer; Certified Health Education Specialist; Certified Strength and Conditioning Specialist® (CSCS®); and National Strength and Conditioning Association (NSCA) Certified Personal Trainer (NSCA-CPT®). Through the BA or BS programs, students have the ability to customize their pathway to select multiple certifications to help them meet their career goals.

“Aligning our curriculum with different certifications has been extremely beneficial. Students can earn a certification from a nationally-recognized organization which is important when entering the job market, and there’s quality assurance that our curriculum meets standards within that profession.”

—Dr. Valerie Wayda, Associate Dean for Undergraduate and Academic Affairs in the College of Physical Activity and Sport Sciences

Another model that convening participants discussed was the idea of creating a new pathway—a pre-professional health science core curriculum, which would include a core set of academic courses that are aligned with a variety of certifications, and could be combined with any academic degree. Possible certifications could include those for phlebotomists, medical records associates, or medical interpreters, or it could result in a new certification (e.g., Certified Health Sciences Professional). The educational pathway would culminate with a baccalaureate degree, a health-professional school (e.g., dentistry, medicine, nursing, pharmacy, physical therapy), and a professional license or certification.



CYBERSECURITY AND INFORMATION TECHNOLOGY (IT)

Purdue University Global and Kaplan worked together to develop a U.S. Department of Labor registered apprenticeship program in cybersecurity linked to an academic pathway. This program combines the key elements of an apprenticeship – employer engagement, educational instruction, on-the-job training, wage increases as apprentices gain more skills, and certification attainment. The apprenticeship is designed to fulfill most of the major requirements for a BS in cybersecurity. The apprenticeship can be completed in 33 months and includes dedicated talent coaches who guide the apprentice and the employer mentor through the program. The talent coaches help apprentices by providing guidance towards degree completion, career coaching, and facilitating the transfer of learning to the specific work environment.

Network+, Linux+, Security+, Certified Ethical Hacker (CEH), and Certified Information Security Systems Professional (CISSP) certifications are embedded into the apprenticeship program, and requirements of the BS in cybersecurity provide the student/apprentice with requisite knowledge. This model utilized for cybersecurity was then replicated for cloud computing, where the apprentices work towards obtaining a BS in cloud computing and three specified certifications: (1) MSCA Linux on Azure; (2) AWS Certified SysOps Administrator – Associate; and (3) AWS Certified Solutions Architect – Associate. Many of the certifications selected for these apprenticeship programs align with U.S. Department of Defense Directive 8140, which outlines the certifications that meet the requirements to validate the skills for specific job roles.¹⁴

¹⁴ For more information on the U.S. Department of Defense directives, visit <https://www.esd.whs.mil/dd/>.



University of Cincinnati (UC) students can choose between several pathways that include industry-recognized credentials for their degree programs. These include direct course credit (for example, the Cisco Certified Network Associate (CCNA) is embedded in the BS in IT program, and SAP is available to students in the BS and MS in information systems programs). In other cases, students use UC's Digital Skills Lab to contribute to their experiential learning requirement (all baccalaureate students are required to complete credit-bearing experiential learning as part of UC's general education program) by taking professional development courses.¹⁵ During the summer of 2020, more than 950 UC students chose to earn industry-recognized certifications and combine with project-based remote assignments to earn their experiential learning credit. Among the most popular options were related to cybersecurity (towards IT and computer science degrees, minors, and certificates), computer aided design (CAD) and programming (popular among engineers), data analytics and visualization, and project management. Student selections also included foreign languages and artistic platforms.



DevOps is an emerging career field that combines software development and IT operations skills on multidisciplinary teams that work together with shared practices and tools. Felician University, a Franciscan university in New Jersey, is exploring new ways to prepare students and professionals for DevOps careers. Felician is mapping its computer science and cybersecurity curricula to the industry certifications offered by the DevOps Institute.¹⁶

The competencies assessed on the certifications will be integrated into multiple undergraduate courses. This will allow computer science and cybersecurity majors to sit for the certification exams near the end of their bachelor's degree programs. Jennifer Fischer, executive director of the Center for Innovation and Professional Studies at Felician University, said, "We're very pleased to partner with the DevOps Institute to offer high-value industry certifications to professionals who want to upskill or reskill, as well as our degree students, to elevate their employability and differentiate themselves in a competitive

¹⁵ For more information on UC's Digital Skills Lab, visit <https://www.uc.edu/campus-life/careereducation/get-experience/next/digital-skills-lab.html>.

¹⁶ For more information on the DevOps Institute, visit <https://devopsinstitute.com/>.

IT labor market.” Professionals may complete their certification training and access exams through Felician’s micro-learning online platform. Degree students may graduate with both a bachelor’s degree and this stackable credential in-hand. To ensure that all students are able to take the certification exam, the university submitted a grant to cover the cost of the certification vouchers. The first cohort of students will enter this program in 2021.

“DevOps Institute is very excited to collaborate with Felician University to support the needs of both individuals and organizations to enable them with the skills, knowledge, ideas, and learning to be a step ahead in this competitive market that requires the latest innovations in the area of DevOps.”

–Jayne Groll, DevOps Institute CEO

LIBERAL ARTS

There are a number of certifications in such areas as laboratory science, information technology, financial planning, and human resources that have the potential to be embedded in a variety of liberal arts degree programs. For example, biology or chemistry majors would be well positioned to earn certifications from the ASCP Board of Certifications (BOC), such as the Medical Laboratory Technician, MLT (ASCP), or Medical Laboratory Scientist, MLS (SCAP).¹⁷

There are also new certifications being developed that integrate technical skills and skills learned through liberal arts programs. One example is from CertNexus, which is developing a new certification, the Certified Ethical Emerging Technologist™ (CEET) – CET-110, to focus on the ability to apply foundational ethical principles to ensure that emerging data-driven technology (e.g., artificial intelligence, internet of things, and data science) are implemented and maintained ethically, minimizing bias and discrimination.¹⁸

On the other hand, some certifications require candidates to complete a bachelor’s degree as a prerequisite in order to sit for the certification exam. To overcome this, many certification bodies have developed different types of partnerships with universities to ensure that students are aware of and prepared to sit for these certifications. The Certified Financial

¹⁷ For more information on the ASCP BOC certifications, visit <https://www.ascp.org/content/board-of-certification/get-credentialed>.

¹⁸ For more information about the Certified Ethical Emerging Technologist™, visit <https://certnexus.com/certification/ceet/>.

Planner Board of Standards, Inc. (CFP Board) has formed partnerships with 144 bachelor's programs across the country whose graduates meet the education coursework requirements to sit for the certification exam. Other certification bodies like the Society of Human Resource Management (SHRM) have developed curriculum standards for bachelor's degree programs so that the curriculum is aligned with the skills required for human resource professionals.

Certified Financial Planner Board of Standards, Inc. (CFP Board)

The completion of a bachelor's degree is required to become a Certified Financial Planner™ (CFP®), a certification offered by the CFP Board. In addition to holding a bachelor's degree or higher in any discipline, CFP® candidates also must complete the specific education coursework requirement to sit for the CFP® exam. Though universities determine the format for their instruction (e.g., classroom, a hybrid offering, or online) and the program level (e.g., part of an undergraduate or graduate degree program or a non-credit certificate program), each registered program is required to incorporate into their curriculum the 72 principal knowledge topics that students must learn to fulfill the CFP Board education coursework requirement.

“CFP Board is so proud to have 144 registered baccalaureate programs at colleges and universities across the country. The growth in the numbers of undergraduate programs is evidence that academic leadership understand the value a CFP certification will bring to their graduates.”

—Dr. Mary Kay Svedberg, Director of Education at CFP Board

The CFP Board recognizes college and university programs that meet this education coursework requirement through registering and regularly reviewing related academic programs. CFP Board's registered programs can be found at large-scale state universities, private colleges, and every level in between, allowing student candidates to complete their financial planning coursework in the learning environment that best suits their needs.¹⁹

¹⁹ For more information about the [education requirement](#) and CFP Board's [registered programs](#), visit cfp.net.

The Society of Human Resource Management (SHRM)

In the early 2000s, SHRM addressed their members' concerns that content being taught in bachelor's and master's degree programs was not aligned with the skills employers were requiring of human resource (HR) professionals. SHRM held symposia and member forums to better understand the state of education for HR professionals, then met with employers to determine their skills' needs, and validated these findings through survey research with faculty who teach HR, students who study HR, and the employer community. Resulting from this work was the development of the first set of HR curriculum standards, which established a minimum educational standard of entry into the profession. SHRM then gained the support of AACSB, a nonprofit accrediting body for business schools that focuses on improving the quality of business education, to encourage business schools to include HR programs and to use SHRM's curriculum standards for bachelor's and master's degree programs. Currently, 539 programs around the world have adopted these curriculum standards. Universities that adopt these standards must include 17 primary HR topics, 8 behavioral competencies needed to practice HR, and have the option to include 4-5 secondary HR topics in their curriculum.²⁰

The certifications—SHRM Certified Professional (SHRM-CP) and SHRM Certified Senior Professional (SHRM-SCP)—have both education and experience prerequisites to sit for the exam.²¹ Students enrolled in bachelor's and master's degree programs that use the SHRM curriculum standards meet these education prerequisites. And, there are also opportunities for students to fulfill the experience requirements as part of their educational program by completing related internships, working part- or full-time, participating in a directed research or other project work under the supervision of an employer, or through work study.

Additionally, SHRM revalidates the body of competency knowledge every three to four years. To assist faculty, SHRM developed templates and sample course outlines for bachelor's and master's degree programs. SHRM is also developing prepared curriculum for both bachelor's and master's degree programs in HR and focusing on the diversity of HR professionals with targeted outreach to historically

20 For more information on SHRM's academic initiative, visit <https://www.shrm.org/certification/for-organizations/academic-alignment/Pages/default.aspx>.

21 For more information on SHRM certifications, visit <https://www.shrm.org/certification/Pages/default.aspx>.

black colleges and universities and transitioning military personnel. Through all of these efforts, SHRM continues to refine, expand, and strengthen existing, and build new, partnerships with universities to prepare HR professionals to succeed in the workforce.

“The student eligibility program to take the SHRM-CP in the student’s final year of study offers students who attend academic programs recognized by SHRM to earn the certification. This provides these recent graduates the opportunity to enter the job market and the workforce with both a degree and a credential. Doing so underscores the student’s commitment to the field of HR and shows employers that the student has the HR knowledge needed to contribute to the workforce, but also knows how to use that knowledge to perform competently as an HR professional.”

–Nancy A. Woolever, MAIS, SHRM-SCP, Vice President of Certification Operations at SHRM

MANUFACTURING

Several partnership examples were highlighted during the manufacturing convening, including ones in mechatronics and integrated photonics.



Siemens partners with Middle Tennessee State University (MTSU) to prepare students to graduate with both a bachelor’s degrees in mechatronics and Siemens Level 3 certifications. By combining these credentials into a single program, students majoring in mechatronics at MTSU gain the hands-on skills they need to be work-ready for manufacturing careers immediately after graduation. In integrated photonics, the American Institute for Manufacturing Integrated Photonics (AIM Photonics), a federal Manufacturing USA Institute

and MIT's AIM Photonics Academy, anticipated industry needs and formed partnerships with Stonehill College and Bridgewater State University to develop a certificate program in advanced manufacturing and integrated photonics.²² Future plans involve exploring the need for a similar certification program.



Ohio University's (OU) Russ College of Engineering and Technology shared that OU's BS in engineering technology and management (ETM) degree program implemented the completion of the Association of Technology, Management, and Applied Engineering's (ATMAE) Certified Manufacturing Specialist (CMS) examination as a requirement for all of this programs' seniors.²³ The CMS exam covers 16 areas of manufacturing, including technical and managerial areas, which include topics such as Lean Six Sigma, automation, robotics, tooling, CAM, project management, leadership, and supervision. The OU ETM program boasts a 90 percent pass rate for students that sit for the CMS exam, significantly higher than the national pass rate of 56 percent.

“The CMS after the student’s name on their resume becomes a good topic for interviews and professional conversation and allows the student to discuss the comprehensive curriculum of the ETM program. The CMS exam is taken by all senior ETM students and provides an additional assessment point for the ETM program. Attainment of this credential signifies our students’ enhanced readiness for the workforce.”

–Todd Myers, Chair of the Engineering Technology and Management Department at OU

22 For more information about the AIM Photonics Academy, visit <https://aimphotonics.academy>.

23 For more information about OU's BS in engineering technology and management (ETM) degree program, visit <https://www.ohio.edu/engineering/engineering-tech/academics/etm>; For more information about ATMAE's Certified Manufacturing Specialist, visit <https://www.atmae.org/page/Certification>.



Following several years of collaboration with area companies and international firms with large supply chains in the state, The Ohio State University (OSU) launched a new BS in engineering technology (BSET) degree program in the fall of 2020.²⁴The regional campuses are collaborating with the College of Engineering to offer a manufacturing-focused degree that combines hands-on learning and application-based experiences with management and leadership skills. BSET graduates will be well prepared for career opportunities in today's advanced manufacturing industries, with regional campuses partnering with local manufacturers to offer mentorships, solving real-world problems in the classroom and applicable internships.

The intent in aligning industry certifications is to focus on the skills that manufacturing leaders have identified as gaps in the current workforce, as well as build students' business and leadership acumen so they are ready to advance when asked by their employer. The first industry certificate OSU is considering is one approved by the state government education and higher education agencies. OSU is also looking at embedding certifications from the National Institute for Metalworking Skills, SME, and other certification bodies, but these certifications will not be embedded until after the BSET program has been in place for two or three years.

SHARING KNOWLEDGE THROUGH THE HIGHER EDUCATION COMMUNITY

Each university leadership selected multiple representatives to attend the convenings with the goal that they would share the information learned with colleagues and the broader higher education community. As a result, further partnership examples were identified in industry sectors and academic disciplines beyond those that were the focus of the four convenings. For instance, Bridgette Cram, assistant vice president for academic and student affairs at Florida International University (FIU), shared that FIU recognizes that aligning industry certifications with degree programs can offer students several benefits, including their ability to be further prepared to graduate with the competencies necessary to succeed in the workforce. The certification-degree pathways that FIU are exploring are designed to be both integrated into their curriculum as well as offered outside of the curriculum. FIU has begun to integrate certifications within the artificial intelligence/big data track in the College of Engineering and Computing's undergraduate degrees. These pilots launched in the fall

²⁴ For more information about OSU's BS in engineering technology (BSET), visit <https://engineering.osu.edu/engineering-technology>.

of 2020, using certifications related to cloud platforms.²⁵ FIU is looking forward to further developing certification alignment throughout their university to best prepare students with in-demand skills.

Additionally, California State University, Northridge (CSUN) is working towards including the Project Management Institute's Certified Associate in Project Management (CAPM)[®] certification exam prerequisites as part of the engineering management master of science program.²⁶ The prerequisites for taking the certification exam include obtaining an associate's degree and 23 hours of project management education. Completing the engineering project management class, offered as part of the master's degree program, fulfills the 23 hours of project management education requirement—thus both requirements to take the CAPM[®] exam have been met prior to completing the degree program. Additionally, the CAPM exam is now offered completely online and CSUN is considering integrating the exam fully into the program, starting in the fall of 2021.

The interest generated by the convenings and the willingness of attendees to share what they learned with their colleagues further demonstrates interest in this concept. Even after the completion of the convenings, project team members have been connecting participants with each other so that they can continue the conversations and learn more about each other's programs, further validating the need to develop and curate certification-degree pathways. Furthermore, all agreed that highlighting tangible examples of how certification bodies and universities are currently working together can serve as roadmaps for future collaborations. Ultimately these examples will elevate this work and encourage broad adoption.



25 Because FIU is in the midst of finalizing certification partnerships, FIU opted to keep private the names of specific certifications.

26 For more information about the Project Management Institute's Certified Associate in Project Management (CAPM)[®], visit <https://www.pmi.org/certifications/types/certified-associate-capm>.

CONVENING THEMES

The partnership examples highlighted in this report were identified throughout the project and serve to provide guidance to other universities and certification bodies interested in exploring how to align and embed certifications with bachelor's degree programs. By highlighting these models and discussing the benefits of creating certification-degree pathways through the four convenings and beyond, this project has created an environment that encourages representatives to move forward with efforts to align and embed industry certifications into bachelor's degree programs. The convenings also provided a platform for certification bodies and universities to meet each other, discuss the opportunities to create partnerships, and participate in conversations that address some of the challenges with starting new partnerships. In addition to accomplishing its original set of goals, as outlined in the proceeding sections, this project also uncovered four key themes—quality assurance, transparent credentials, scaling affordable pathways, and first credentials for adults—as detailed in the following sections.

QUALITY CREDENTIALS AND QUALITY ASSURANCE

Quality assurance about the different aspects of degrees and certifications are critical to changing the perceptions about non-degree credentials and how such credentials, when combined with degree programs, can increase the employability and marketability of college graduates. Because many certification bodies are not mandated to release outcomes data, this poses a challenge. To that end, the project team has focused explicitly on identifying credible certification bodies and quality credentials. The project team also

identified key questions universities should consider asking certification bodies to assist them in determining the quality of the certification.²⁷

As expected, quality assurance was a theme that received much consideration and discussion during the project convenings, from both certification bodies and universities. What became apparent through convening discussions is that students, faculty, and employers must have confidence in the quality of both certification and degree programs, and how together these credentials send a stronger signal to employers about what students know and are able to do. Faculty and administrators should understand how certification bodies identify the competencies assessed on the certification exam and the process used to develop the assessment. In addition, information about whether employers recognize the certification as part of the hiring and promotion process must be gathered. Also, these signals of quality and value may contribute to employers' willingness to provide work-based experiences that further enhance potential workers' effectiveness. Through stronger relationships, universities and certification bodies can improve their ability to assess quality, leading to the development of enhanced pathways for students.

TRANSPARENCY

The project proposal highlighted the need for transparency, as certification bodies and universities do not have a track record of working together—naturally both groups have a skepticism and wariness when considering one another's role in workforce development. Consistent with the quality assurance concerns articulated previously, and with the project teams' anticipation of needs, convening attendees from both universities and certification bodies also expressed frustration at the lack of transparency in each sector.

University representatives shared their lack of knowledge regarding certification exam blueprints, particularly around the development and validation of content. They also articulated the absence of clear direction on what certifications might align and embed with undergraduate degree programs. Likewise, certification body representatives expressed a lack of knowledge of university policies, processes, governance, and accreditation concerns. In addition, there needs to be an understanding of how degrees and certifications are developed, what they measure, and how they are perceived by hiring managers. Clarification of these processes not only result in greater transparency, but will provide the information to

²⁷ See "[Appendix F: Questions Universities Can Ask Certification Bodies to Assess Quality of Certifications](#)" for the full list of questions.

assess issues of quality. All agreed that more and better communication and collaboration are necessary.

By being transparent and working directly with one another, universities and certification bodies can collaborate on degree curriculum, yielding better-prepared students to sit for certification and licensure exams, as well as to enter the workforce upon graduation. Students benefit from this increase in transparency because it enables the curriculum to be aligned with the competencies assessed on a certification exam, and degree programs can be promoted as leading to certification instead of solely viewed as preparatory. This will also lead to students becoming more critical consumers of credentials.

Furthermore, it is critical for such university leaders as department chairs and deans to support and acknowledge partnerships so that changes in curriculum and degree requirements are easier to accomplish. In addition, partnerships that have support from leadership are more likely to survive when there are changes in faculty and academic departments. To this end, participants suggested that one output of the next phase of this work should include the development of a map or matrix focused on certifications (e.g., prerequisites, competencies, university partnerships, employers that recognize the certification). This would provide the details that could help faculty who lack that knowledge and/or the network to seek out this information embed industry-recognized credentials in degree programs. It also became evident that until the higher education and certification



communities offer more transparency and use a common language—such as competencies—in describing their programs, it will continue to be challenging to create the needed alignment.

Convening attendees provided detailed feedback to support this project and advocated for this work within their respective communities. The certification body and university representatives demonstrated their willingness to actively engage in the project, were forthcoming in their observations, and encouraged the project team to build a broader community around this effort. In essence, they both were transparent in terms of their own project engagement and desired overall project transparency. In terms of improving the transparency of credentials, all representatives were willing to explore how this work could provide greater clarity on the requirements and value of both degrees and certifications to industry, employers, and students alike.

SCALING AFFORDABLE PATHWAYS

This work also supports the scaling of affordable pathways. The faculty and leaders, certification bodies, and employers who participated in the convenings shared a newfound understanding of how certifications and degrees can be integrated to efficient and affordable certification-degree pathways. For large-scale change to occur, it is critical to explore the most economical and feasible intersections of the academic curriculum and the competencies measured by the certification exam. Further, certification bodies must strive to understand university processes for creating new programs, and whether there are opportunities to better link degree programs to certifications that result in more affordable pathways. To this end, some certification bodies shared that they are developing micro-certifications, which are smaller, discrete, specialized opportunities for skills assessment.²⁸ For this reason, micro-certifications may be more easily and economically aligned with academic courses.

During the convenings, many noted the need to reduce the costs incurred by students in earning both a degree and a certification(s). Recognizing prior learning and/or providing college credit to those who already hold a certification(s) are among the opportunities to reduce the time and cost incurred, which could also lead to engaging universities that serve traditionally underserved populations. Convening participants shared that buy-in from all levels, including faculty, department chairs, president/chancellors, certification body directors of certification and/or executive directors, as well as employers, was also necessary in this step.

28 Reed Castle, Christine DePascale, and Christine D. Niero, *Making the Business Case for Micro-Credentials*: 2019. Professional Testing, Inc. <http://www.proftesting.com/store/product/micro-credentials-model-guide/>.

FIRST CREDENTIALS FOR ADULTS

Finally, this project helped to further highlight the need for adults to earn their first credential. According to a New America report, only one-fifth of U.S. adults have a certification(s), and adults with baccalaureate degrees are only slightly more likely to obtain one than adults without degrees.²⁹ Still, for those who do not hold any credentials, beginning with a combination of a certification and a degree is likely to provide more value to those who have no credentials, or only one of the two. In the U.S., nearly 11.2 million adults who have a high school diploma or less have also gotten a professional certification or license.³⁰ Furthermore, in mid-2020, Lumina Foundation recognized the value of certifications by including them as part of their goal of having 60 percent of working-age Americans with a credential beyond high school.³¹

Convening participants shared their desire to consider models that allow for certification content or exams to be incorporated early in degree programs, supporting students who may not continue pursuing their degree for whatever reason. Additionally, noting the impacts of the COVID-19 pandemic, credentials embedded early in undergraduate programs could profoundly impact the employment opportunities of students. As Strada Education and Simpson Scarborough learned through recent surveys, the COVID-19 pandemic has altered learners' plans for education in the near future.³² And many students are choosing between continuing their education and financially contributing to their households. A credential earned early in the pursuit of an undergraduate degree could have an even greater impact given current economic conditions, especially for food- or housing-insecure, single parent, and/or minority students, who have the greatest risk of dropping out of college and are also more likely to suffer the ill-effects of the pandemic.³³

29 Michael Prebil and Mary Alice McCarthy, "Building Better Degrees Using Industry Certifications: Lessons from the Field" (Rep.): September 2018. New America. <https://www.newamerica.org/education-policy/reports/building-better-degrees-using-industry-certifications/background>.

30 Stephanie Ewert and Robert Kominski, "Measuring Alternative Credentials: 2012." January 2014. U.S. Census Bureau. <https://www.census.gov/prod/2014pubs/p70-138.pdf>.

31 "A Stronger Nation," June 2020. Lumina Foundation. <https://www.luminafoundation.org/news-and-views/new-data-show-51-3-of-u-s-adults-hold-degrees-certificates-or-industry-certifications/>.

32 "Public Viewpoint: Covid-19 Work and Education Survey," Strada Education Network, April 7, 2020, <https://www.stradaeducation.org/publicviewpoint>; and "The Impact of COVID-19 on Higher Education," Simpson and Scarborough. <https://impact.simpsonscarborough.com/covid/>.

33 While these observations are relevant given the current conditions, the project team notes that all convenings occurred prior to any reported COVID-19 infections in the U.S., and therefore convening participants' observations and discussion were not conducted in light of the pandemic, social-distancing orders, or economic downturn.



RECOMMENDATIONS AND FUTURE DIRECTIONS

The project team and project participants learned a great deal during this project about the opportunities and challenges associated with creating certification-degree pathways. Yet, this is just the beginning and more work needs to be done to test and implement these pathways. The need to address educational inequity continues to grow in importance. What has been learned through this project to align and/or embed certifications into bachelor's degree programs can be used as a strategy to help address that inequity. A next phase of this project can focus on minority serving institutions (MSIs), many of which are members of APLU, USU, or UPCEA, to help test certification-degree pathways by using the framework created from the information gathered both during the convenings and through follow-up conversations. Additionally, increasing the transparency and understanding of skills attainment through aligning and embedding certifications into degrees is one key area that can help reduce the bias that employers might implicitly apply to historically underrepresented students. Degree programs can further provide security to students when combined with earning a certification that is valued in the labor market, and provide bachelor's degree students with an opportunity to demonstrate and apply what they have learned in their academic programs. As such, all students, but especially those historically underserved, could observe better labor market outcomes.

The certification-degree pathway models would be designed to be accessible to and used by all students—especially those historically underserved. Each model would test the individual elements identified

in the certification-degree pathway framework to determine how they contribute to the success of the pathway, including:³⁴

- » obtaining and sustaining leadership buy-in,
- » creating a common language,
- » aligning certification exam competencies and academic course and program learning outcomes,
- » determining the appropriate fit for a certification within an academic program,
- » allocating resources, and
- » identifying how credentials will be shared with external audiences such as employers.

Additionally, data for each model would be gathered on education quality outcomes standards such as learning, completion, satisfaction, placement, and earnings to evaluate the effectiveness of the certification-degree pathways framework.³⁵ In addition, it is important to collect data on who benefits from these certification-degree pathway models to ensure they are designed for and result in equitable outcomes.

A second phase of this project will also need to tackle the issues associated with payment and affordability. Currently, certification exam costs are usually not a part of the cost of the degree when taken independently, and students must seek additional funding to take the certification exam. While the models highlighted in this project have been developed at the local level, and their approaches to funding are necessary in the short-term, for certification-degree pathways to scale, more research needs to be done on funding sources for these pathways. This challenge is one that needs to be tackled by a united community rather than each represented university or certification body individually, to aid in the development and sustainability of the certification-degree pathway on a larger scale, as well as to further prevent the perpetuation of inequities we see in the current workforce/education ecosystem.

In addition to testing certification-degree pathway models, a second phase of this work will continue to cultivate the community of practice that was started during this project. The project team believes that with effective coordination and the goals of rapid prototyping, model building, and information sharing, this community will create more effective practices, which can then be disseminated to accelerate innovation, leading to the development of successful certification-degree pathways across universities and certification bodies.

A well-defined and active community of practice also provides a compelling reason for employers to engage in developing and supporting these pathways. Employer engagement

34 See [Figure 2: Certification-Degree Pathway Framework](#) as described earlier in the report.

35 For more information about education quality outcomes standards, visit <https://www.educationqa.org>.



is critical for the sustainability of these pathways on multiple levels, indirectly by hiring individuals who have completed these pathways and more directly by providing resources to support their implementation. Without this defined community, employers would need to engage certification bodies or universities on an individual level, significantly increasing their time and resources to engage. Additionally, the approaches used by the existing pathways highlighted in this project also required an extensive investment of resources by universities, and—to a lesser degree—certification bodies. A second phase of this project could attend to the matching process between certifications and degree programs, aiding in the reduction of these barriers for all stakeholders.

Throughout the project, the project team gathered new and existing knowledge and highlighted and disseminated effective practices. Through this work, the project team also discovered ideas and activities that went beyond the scope of this project, and strongly feel that these additional areas require further exploration:

- » Expanding the knowledge of how other stakeholders in higher education curriculum (e.g., regional and program accreditors, employers) view the concept of embedding certifications and other non-degree credentials into bachelor’s degree programs, and including their input;
- » Identifying and breaking barriers around the current state of quality assurance, trust, and transparency issues between certification bodies and colleges and universities, which would help universities to identify certifications that align with curriculum and other institutional needs;

- » Determining the scalability and sustainability for the pathways, as well as consortia models whereby multiple universities and credentialing bodies can meet workforce demands through embedding industry certifications across several degree programs, or “regionalization;”
- » Exploring employers’ expectations and use of credentials;
- » Addressing the affordability and funding opportunities of combined programs;
- » Aiding in the recognition of prior learning achievements of certifications;
- » Integrating opportunities for remote and online learners to satisfy experiential or performance-based demonstrations of learning; and
- » Creating models for avoiding educational attainment inequities.

Both the project outcomes discussed throughout the report, as well as the new observations stated above, substantiate the need for additional work, including further development, testing, and dissemination of partnership models scaled to serve diverse learner populations by universities of varying mission, size, and resources. This project uncovered a pathway for the prototyping of aligning and embedding industry credentials into bachelor’s degrees, and even more importantly, an eagerness among certification bodies and the higher education community to innovate in this space, which would affect change throughout the postsecondary landscape. Further, a second phase of this work could address the unexplored areas outlined above in order to develop the most robust and ultimately sustainable pathways.

In conclusion, this project uncovered many of the current opportunities, barriers, and pathways to aligning and/or embedding industry certifications into bachelor’s degree programs. Through these, the need for future research and the development of new learner opportunities became evident. While this project served to illuminate current models and practices, the project team believes there is potential to continue this work by testing certification-degree pathway models and building an active community of practice. By continuing this work, there can be a significant impact on the attainment of relevant, industry-valued, postsecondary credentials for learners of all types. The project team is both excited and encouraged by these pathways and will seek opportunities to leverage and continue this work to positively impact the workforce development ecosystem.

Thank you for reading our Certification-Degree Pathways Framework report. This report is an initial attempt to capture opportunities, challenges, and examples of integrating certifications into bachelor's degrees. We realize that there is more information to discover, and would be delighted to hear your thoughts on the content of the report, or if you have input or examples of a certification-degree pathway. In addition, as we plan future phases of this work, we would like your input about how to shape them. [Please provide your input through this very brief survey.](#)



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