

# INTEGRATING MICROCREDENTIALS

into Undergraduate Experiences



April 2023

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1899 L Street, NW, 11th floor  
Washington, DC 20036

[workcred.org](http://workcred.org)

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Formed in 2014, Workcred is an affiliate of the American National Standards Institute (ANSI). Its mission is to strengthen workforce quality by improving the credentialing system, ensuring its ongoing relevance, and preparing employers, workers, educators, and governments to use it effectively. Workcred's vision is a labor market that relies on the relevance, quality, and value of workforce credentials for opportunities, growth, and development.

## The University of Texas System

210 West 7th Street  
Austin, TX 78701-2982

[www.utsystem.edu](http://www.utsystem.edu)



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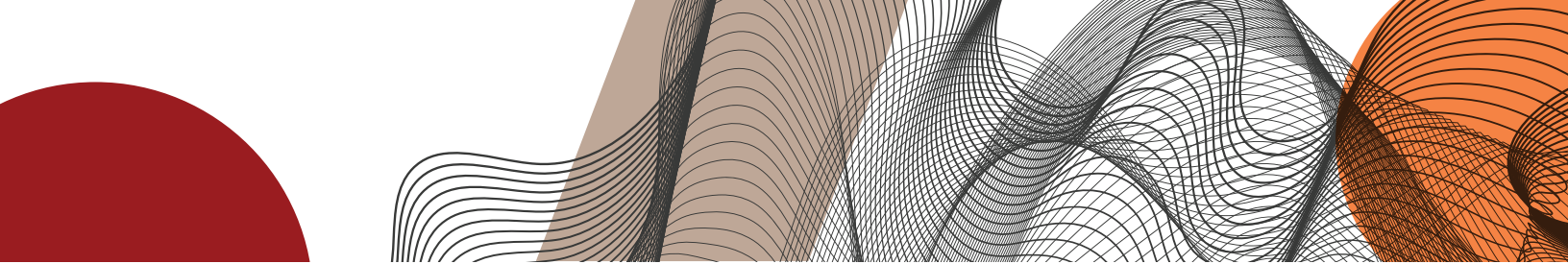
For nearly 140 years, The University of Texas System has improved the lives of Texans and people all over the world through education, research, and health care. With thirteen institutions that enroll more than 244,000 students collectively, the UT System is one of the largest public university systems in the United States. UT System institutions produce more than 68,000 graduates annually and award more than one third of undergraduate degrees in Texas and more than 60 percent of the state's medical degrees. Collectively, UT-owned and affiliated hospitals and clinics account for more than ten million outpatient visits and more than two million hospital days each year. UT System institutions are among the most innovative in the world, ranking number one in Texas and number two in the nation for federal research expenditures. The UT System also is one of the largest employers in Texas—employing more than 116,000 faculty, health care professionals, and staff—and has an annual operating budget of \$25.2 billion.

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# TABLE OF CONTENTS

<b>Background</b>	<b>1</b>
<b>Purpose and Definitions of Microcredentials</b>	<b>2</b>
<b>Value of Microcredentials</b>	<b>4</b>
<b>Factors to Consider When Building or Selecting a Microcredential</b>	<b>6</b>
Access	7
Alignment with a Degree or Co-curricular Experience	7
Assessment Development	8
Communicate the Value to Stakeholders	8
Conveyance of Skills and Competencies	9
Credit or Non-Credit	11
Delivery Format	12
Governance Structure	13
Industry/Employer Recognition	15
Level of Rigor	15
Prerequisites	16
Purpose	17
Target Population	18
Time to Completion	19
<b>Relationship between Microcredentials and Badges</b>	<b>20</b>
<b>Commonly Identified Skills in Liberal Arts and Data Analytics</b>	<b>21</b>
<b>Promising University and Microcredential Practices in Digital Skills and Data Analytics</b>	<b>22</b>
Coding	22
Data Ready!	22
Data Visualization	23
Essential Tableau Skills	23
Professional Industry/Employer Certificates and Certifications	23
Thinking and Communicating with Data	25
<b>Approaches to Align Data Analytics Microcredentials with Academic Curriculum and Degrees</b>	<b>26</b>
Increase Transparency of Skills in Existing Courses or Degrees	26
Create New Microcredentials Using Certification Exam Blueprints to Inform Skills	26
Embed Data Analytics Skills in General Education Courses	27
Create a Co-Curricular Experience	27
Embed an Industry/Employer Credential into an Academic Degree	28
<b>A Framework to Develop and Integrate Microcredentials into Undergraduate Experiences</b>	<b>30</b>
Buy-in	31
Conduct a Needs Assessment	31
Build the Team	32
Develop/Adopt the Microcredential	33
Deliver the Microcredential	34
Assess the Effectiveness and Value of the Microcredential	35
<b>Assets to Support Microcredentialing Efforts in the UT System</b>	<b>36</b>



# BACKGROUND

The University of Texas System (UT System) received a planning grant in support of efforts to reimagine liberal arts and humanities degree programs to incorporate data analytics microcredentials that ensures graduates are broadly educated (degree) and specifically skilled (microcredential). The UT System partnered with Workcred to conduct a workshop in September 2022 to explore how undergraduate students majoring in humanities and liberal arts could earn a data analytics microcredential and a bachelor's degree, potentially increasing their employment opportunities and earnings outcomes.

During the workshop, faculty and administrators from across five UT System institutions—University of Texas at Austin (UT Austin), University of Texas at El Paso (UTEP), University of Texas at Tyler (UT Tyler), University of Texas at San Antonio (UTSA), and University of Texas at Arlington (UT Arlington)—collaborated to explore and plan how to integrate microcredentials that signify data analytics knowledge and skills most valued by employers. This process included determining if there were existing employer credentials, either certificates or certifications, that could be aligned or integrated into undergraduate experiences, or if the best solution would be to have faculty develop new microcredentials with input from industry subject matter experts. By working as a consortium of institutions, the participants discussed opportunities to use microcredentials, while ensuring flexibility for each institution to best meet the needs of its students and regional employers.

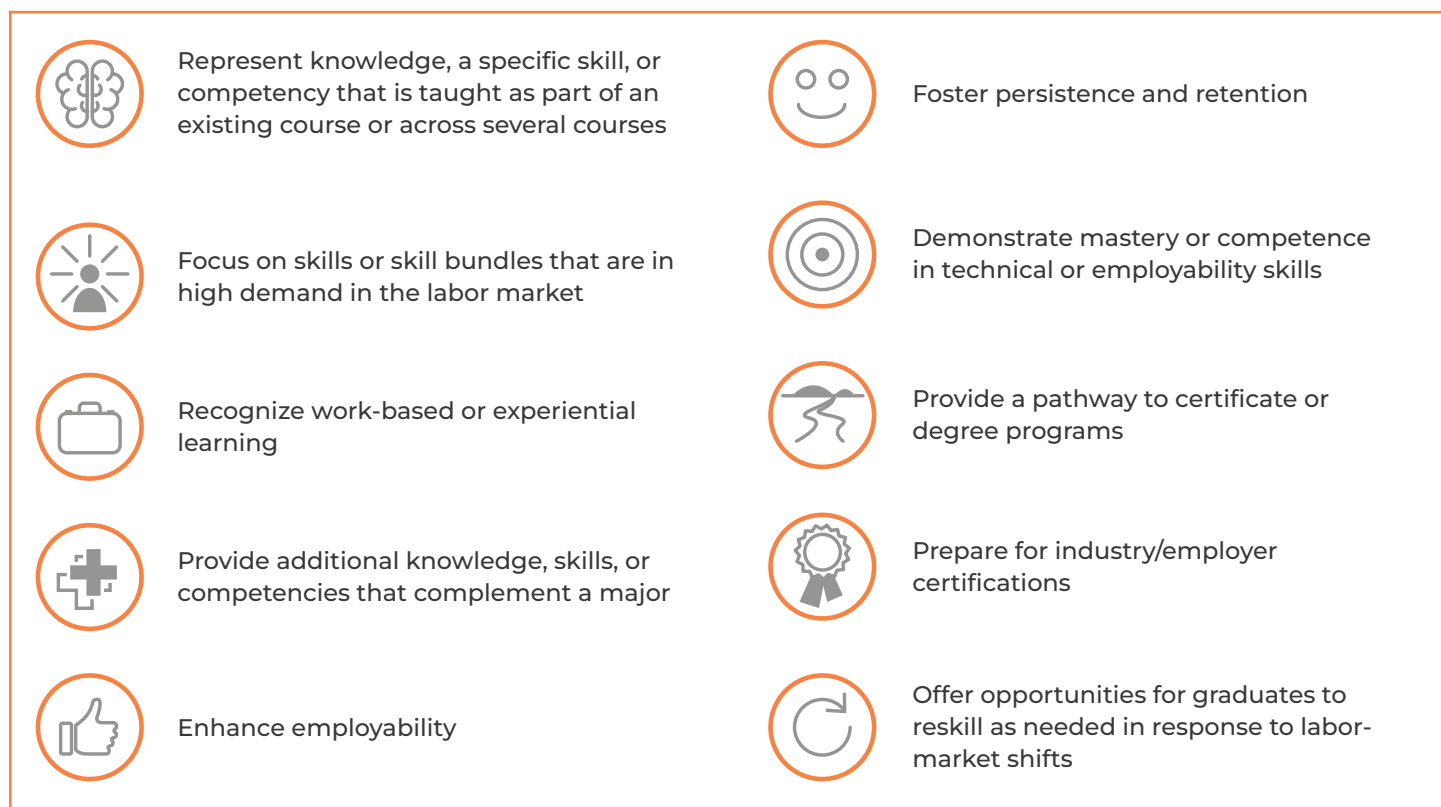
This report builds upon the discussions from the workshop to provide an overview of microcredentials; factors to consider when building or selecting a microcredential; the relationship between microcredentials and badges; promising microcredential practices in digital skills and data analytics; commonly identified skills in liberal arts and data analytics; approaches to align data analytics microcredentials with undergraduate experiences; a framework to guide the development and implementation of microcredentials; and assets to support microcredentialing efforts in the UT System.

# PURPOSE AND DEFINITIONS OF MICROCREDENTIALS

Nearly all universities have clear definitions for degrees, certificates, and academic majors and minors that are consistent within the institution, and often comparable across institutions. Within an institution, these common definitions also share common governance processes and policies, and provide faculty and administrators with clear guidelines for the development and implementation of new credentials. It also allows for clear signaling and communication to students and employers who need to understand and utilize these degrees, certificates, majors, and minors.

This consistency of definitions is not typically the case for microcredentials, where there is significant variation in their use, meaning, and guidelines for development.

**Figure 1: Ways Microcredentials Are Used by Colleges and Universities**

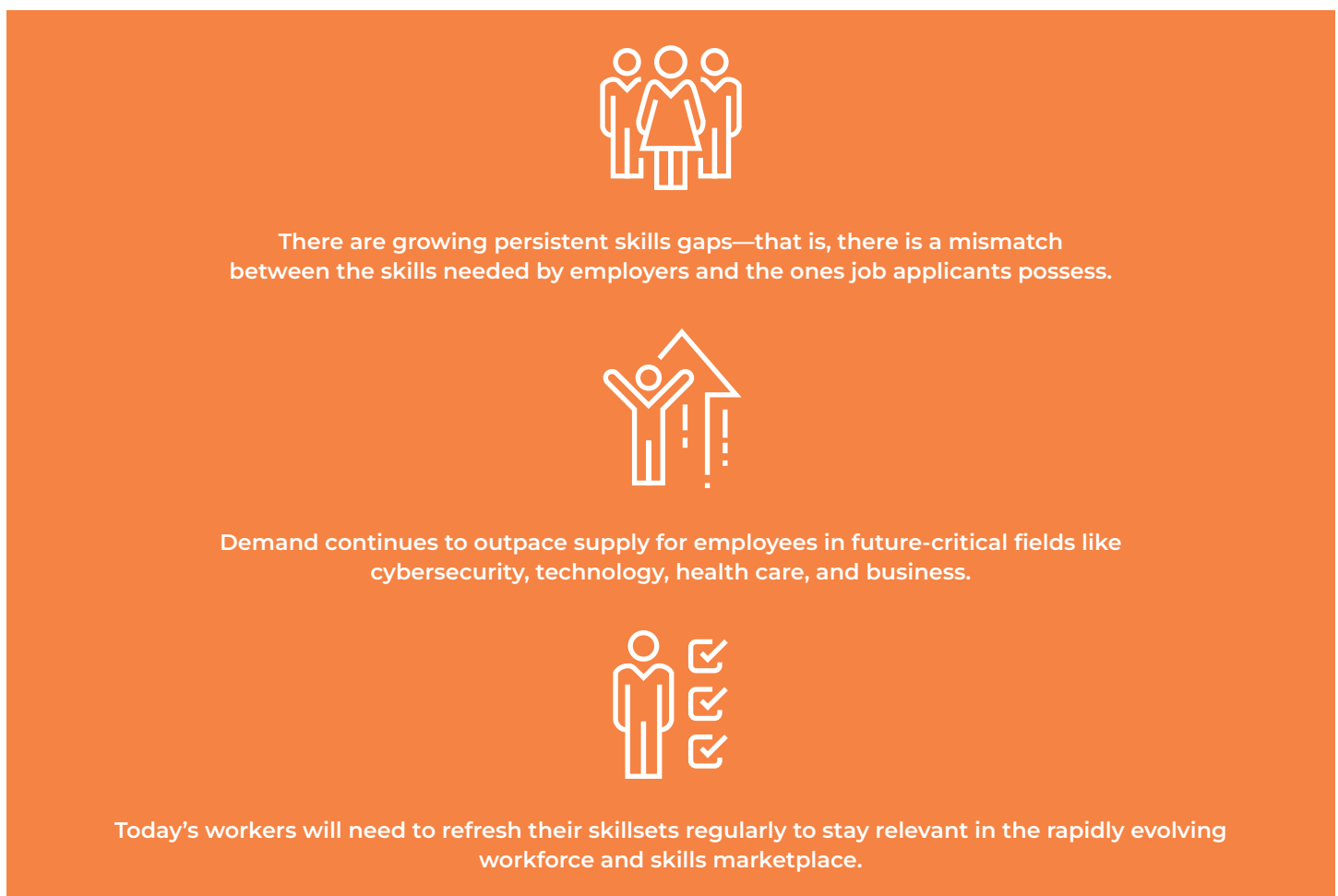


As Figure 1 shows, microcredentials have become a commonly used approach to meet a range of different needs for faculty and administrators. The lack of a common definition across and/or within institutions provides this flexibility and allows for more innovation to serve current students, as well as positioning the university to respond to the lifelong learning needs of its graduates.

However, this variability in use among institutions may also lead to confusion about when and how an institution should develop a new microcredential. As a result, some institutions and university systems, such as the State University of New York (SUNY) and the UT System, have developed a common and consistent definition for microcredentials. For example, the UT System defines a microcredential as a short-term, employer-recognized credential that is in high-demand. As outlined in Figure 2, the UT System launched Texas Credentials for the Future, an effort focused on microcredentials that can quickly arm learners with the skills, knowledge, and competencies most valued by employers.<sup>1</sup>

Adopting a common definition and creating new or using existing governance processes ensures that faculty and administrators understand the purpose and use of microcredentials within their institution, as well as the relationship of microcredentials to other credentials offered.

**Figure 2: Microcredentials as a Solution to Current Challenges**



1 “Texas Credentials for the Future,” The University of Texas System, accessed January 17, 2023, <https://www.utsystem.edu/sites/microcredentials>.



# VALUE OF MICROCREDENTIALS

Two recent reports examining the value of microcredentials suggest that they can provide benefits to learners, universities, and employers alike. In 2021, Strada-Gallup survey data on non-degree credentials, including microcredentials, emphasized the value that college graduates place on non-degree credentials.<sup>2</sup> In comparison to people with only a college degree, those with college degrees and non-degree credentials reported stronger agreement that their combined education helped them achieve their goals, was worth the cost, and made them more attractive job candidates. These trends were consistent across multiple industries. Interestingly, non-degree credentials issued by higher education institutions garnered the highest rating from respondents.

Data from the 2022 Coursera survey, “Advancing Higher Education with Industry Micro-Credentials,” was also consistent with the Strada-Gallup findings. Specifically, this survey focused on professional certificates, which Coursera defines as a type of microcredential from major companies that addresses specific skills and includes hands-on projects used in entry-level jobs such as data analysts, software developers, and digital marketers.<sup>3</sup> The survey noted that 86 percent of students in the U.S. agree or strongly agree that earning an entry-level professional certificate will help them stand out to employers and secure jobs when they graduate. Employers agree with this viewpoint, with 86 percent of U.S. employers surveyed stating they believed industry microcredentials strengthen a job application.

**86%** OF STUDENTS

*say that earning an entry-level professional certificate will help them stand out to employers and secure jobs when they graduate.*

**86%** OF EMPLOYERS

*say that industry microcredentials strengthen a job application.*

**55%** OF STUDENTS

*say that taking a microcredential that counted toward their academic degree was a key consideration when selecting a microcredential.*

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2 “Examining the Value of Non-Degree Credentials,” Strada Center for Education Insights, July 28, 2021, <https://cci.stradaeducation.org/pv-release-july-28-2021>.

3 “Advancing Higher Education with Industry Micro-Credentials,” Coursera, accessed February 23, 2023, <https://www.coursera.org/campus/resources/ebooks/industry-micro-credentials>.

This survey also showed that students want to take microcredentials as part of their degree programs, and would be significantly more likely to enroll in an academic degree program if it included an industry microcredential. In fact, 55 percent of all students in the global survey highlighted that taking a microcredential that counted toward their academic degree was a key consideration when selecting a microcredential. Other important considerations included job placement data for credential holders and employer endorsements.

In all, microcredentials provide universities with an opportunity to impart specific, in-demand skills that complement their degree programs. In addition, universities can position themselves as institutions for lifelong learning where graduates can return to reskill as needed in response to labor-market shifts.



Photo courtesy of the University of Texas at San Antonio

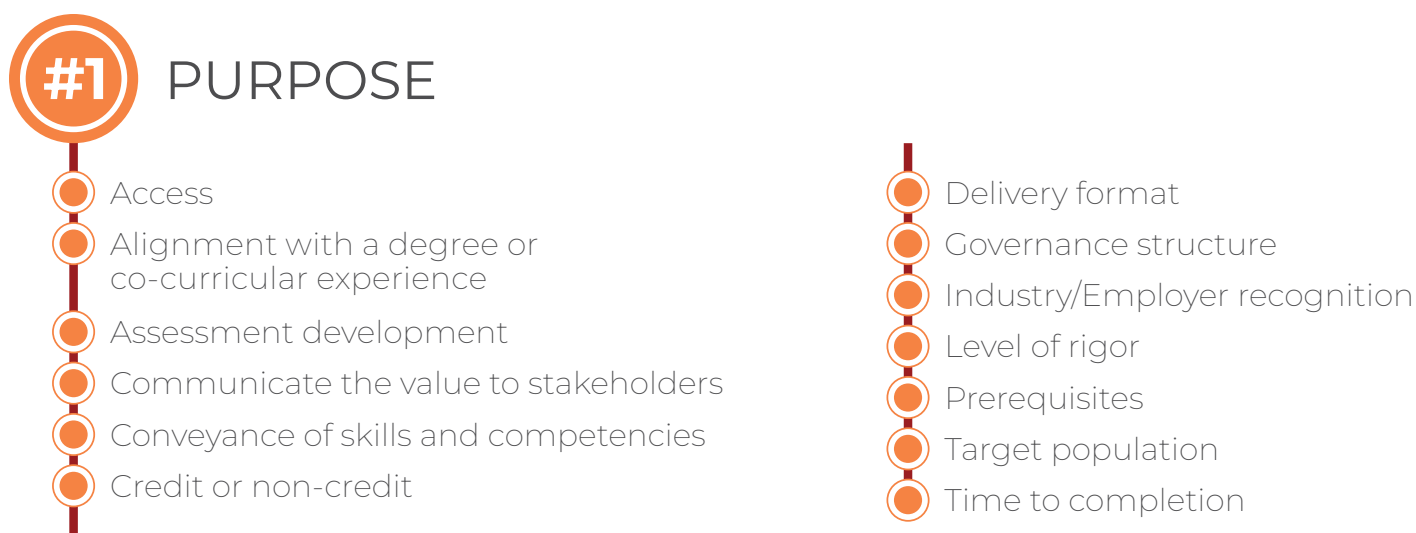


# FACTORS TO CONSIDER WHEN BUILDING OR SELECTING A MICROCREDENTIAL

Regardless of which definition of microcredential is used within an institution, there are a number of factors that faculty and staff should consider when deciding to create a microcredential or to offer a microcredential from another organization (see Figure 3). These factors address issues and considerations around purpose, skills, audience, access, value and recognition, format, and governance.

Although described individually below, these factors are highly interrelated. For example, the target population for the microcredential will influence the delivery method and should also impact any prerequisites that would be required. Similarly, the purpose of the microcredential may be tied to the skills and competencies it represents, level of rigor, time to complete, alignment, or other factors. This flexibility to address these factors is a strength of microcredentials; however, it requires careful consideration of these factors to ensure the resulting microcredential meets its intended purpose.

**Figure 3: Factors to Consider when Building or Selecting a Microcredential<sup>4</sup>**



<sup>4</sup> Author's Note: The factors to consider when building or selecting a microcredential are listed in alphabetical order in the report. However, the factor that should be addressed first is purpose.

## ACCESS

Issues regarding access should be considered as the microcredential is being designed. This process can begin by determining which students would benefit by earning the microcredential. Once the potential microcredential earners are identified, consider if there are any barriers that would prevent them from enrolling in the microcredential. For example, if the target student population is liberal arts majors and the university's overall population is comprised of working learners, then the best format for this microcredential is an asynchronous format to ensure that students do not miss the opportunity to take it due to a scheduling conflict.

Another area in which access plays a crucial role is if the microcredential includes a cost that is beyond that of tuition. For example, if a certification exam is part of a microcredential, there will be a cost for the student to take the exam. The exam cost could be covered by federal financial aid if the certification and the exam were embedded as part of the curriculum for a course or a program. However, if the same certification was included in a co-curricular microcredential, the student would be responsible for the cost, which could be a barrier to access for students from low-income backgrounds.

Issues related to access could arise in other areas as well. For example, a microcredential with multiple prerequisites would limit which students could enroll in and subsequently earn a microcredential. As a result of these types of challenges, faculty and staff should be very deliberate to ensure that there are not unnecessary barriers that may prevent students from accessing or completing microcredentials.

## ALIGNMENT WITH A DEGREE OR CO-CURRICULAR EXPERIENCE

Microcredentials can be designed to be aligned or embedded with academic degree programs. At the University at Buffalo Department of Sociology, for example, there is a Crime and Justice in a Diverse Society microcredential, which is aligned with the bachelor of arts degree in sociology and also offered to non-degree students. Students must earn at least a grade of "B" in one required course and two elective courses for a total of nine credit hours. Upon completion of the courses, students are required to write a paper that integrates knowledge learned from the coursework.<sup>5</sup> The microcredential is included on students' transcripts and they receive a digital badge, which can be used to indicate to employers that they have obtained specific skills in addition to those earned through their principal sociology degree or as a standalone credential.

Microcredentials can also be used to show that students participated in co-curricular activities. At the University of Colorado Boulder (CU Boulder), there is a Workplace Skills for Student Employees microcredential, which consists of three badges in communication, leadership, and onboarding and training.<sup>6</sup> Critical thinking, teamwork, and problem solving are some of the skills that students demonstrate by

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5 "Micro-Credential in Crime and Justice in a Diverse Society," University at Buffalo, Department of Sociology, accessed December 1, 2022, <https://arts-sciences.buffalo.edu/sociology/undergraduate/crime-justice-micro-credential.html>.

6 "University of Colorado Boulder," Credly, accessed December 1, 2022, <https://www.credly.com/organizations/university-of-colorado-boulder/badges>.

working at least seven hours per week for sixteen weeks, achieving a score of “exceeding expectations” on a performance evaluation that is based on a rubric, and submitting documentation about what they learned during their work experience.

## **ASSESSMENT DEVELOPMENT**

Typically, individuals must pass an assessment or a series of assessments to earn a microcredential. These assessments vary greatly and might include written, oral, or performance-based exams, self-reflection assignments, presentations, projects, or a combination of these types of assessments. The type of assessment used should be transparent to employers so that they have confidence that the microcredential holder has achieved the desired competencies.

Whatever type of assessment is used, the assessment must be aligned with the learning objectives of the course or series of courses. This is critical since the microcredential conveys to employers that the holder has knowledge or can perform a set of skills. Many higher education institutions have departments with expertise in testing and measurement and can be a resource to help develop high-quality assessments. For example, the UT Austin Department of Educational Psychology offers a doctoral and master’s specialization in quantitative methods.<sup>7</sup> Faculty and graduate students from programs such as these can use their knowledge and expertise to provide valuable guidance in developing high-quality assessments.

## **COMMUNICATE THE VALUE TO STAKEHOLDERS**

Consumers of microcredentials must be able to explain the skills and competencies represented by the microcredential and understand the value in someone earning it. To accomplish this, there must be communications campaigns that target both students and employers. Employers need to understand what skills and competencies an individual should have if they earned a microcredential. In doing so, employers will be better able to find value in the microcredential, and in turn will desire more students and other job candidates with it.

As another consumer of microcredentials, students should be equipped to communicate to employers the skills and competencies that they have as a result of earning the microcredential. If a digital badge is awarded upon earning the microcredential, then students need guidance about how to use and share the badge. For example, Florida International University (FIU) issues its badges through Credly and there is a webpage that provides information for students about how to claim their badges and

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7 “Quantitative Methods,” The University of Texas at Austin, College of Education, accessed November 7, 2022, <https://education.utexas.edu/departments/educational-psychology/graduate-programs/quantitative-methods>.

share them on LinkedIn, in email signatures, and on websites.<sup>8</sup> Some universities, such as SUNY Buffalo and CU Boulder, issue a digital badge and add a notation on the student's transcript that they earned a specific microcredential.

There continue to be efforts to explore how microcredentials, wherever they are earned, can be more easily shared. AACRAO promotes the use of Comprehensive Learning Records (CLR), which include learning experiences that students have inside and outside the classroom.<sup>9</sup> In addition, there are many organizations exploring and testing digital wallets and other technology solutions to share verifiable credentials.<sup>10</sup> Employers will also benefit by having a better understanding of microcredentials if digital badges with metadata are issued to students.

## **CONVEYANCE OF SKILLS AND COMPETENCIES**

Regardless of the type of microcredential, the focus should be on skills and competencies. Once the value is established, the in-demand skills and competencies that should be part of the microcredential need to be identified. Colleges and universities can begin by using their internal research capabilities or working with external vendors to conduct a labor-market analysis. The skills identified should then be validated within each level of employer organization (e.g., practitioner, supervisor, hiring manager) to ensure that the correct skills are being identified. Discussions with employers should also be held to ensure that the skills represented by the microcredential are relevant to what is needed in the job roles and to determine if employers will recognize the microcredential as part of their hiring process. In some instances, employers signal the value of the microcredential by including the skills and competencies in their job postings, but this is not always the case, so it is important to involve the relevant employers when creating the microcredential.

In addition to the external labor-market analysis, faculty can analyze the skills that are taught in their courses and degree programs. A gap analysis can then be done to compare the skills identified in the labor-market analysis with those that are being taught in the college or university. Once this analysis is complete, the faculty can determine if a microcredential can be used to fill a skills gap. Alternatively, faculty may determine some degree programs already deliver workforce-relevant skills that are not readily apparent to prospective employers. In these instances, institutions may consider adopting digital skills badges or other digital signifiers to demonstrate skills and competencies that would not otherwise be apparent.

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8 "Claim Your Badge," Florida International University, Academic and Student Affairs Office of Micro-Credentials, accessed October 26, 2022, <https://microcred.fiu.edu/claim-your-badge>.

9 Brenda Schumann, et al., Alternative Credentials: Consideration, Guidance, and Best Practices: Alternative Credentials Workgroup Report 2022 (AACRAO, 2022), <https://www.aacrao.org/research-publications/work-group-reports-archived>.

10 Maria Flynn, et al., Building a Skills-Based Talent Marketplace: Verifiable Credentials Wallets for Learning and Employment (JFF Labs, 2022), <https://info.jff.org/hubfs/Market-Scan-Digital-Wallet-vF-1.pdf?hsCtaTracking=0f76ec2a-e3f0-4475-9c19-98a6bf797491%7Cf5a9c8e1-96bc-4975-8222-1a9287004ef6>.

In providing the means for students to demonstrate that they have achieved specific skills and competencies, microcredentials have a lot of flexibility in how they can be used to convey that information, including:



Highlighting skills that are already being taught in a course or a series of courses but need to be made more transparent to students and employers



Incorporating existing industry certificates (e.g., Google Digital Marketing and E-Commerce Professional Certificate, IBM Cybersecurity Analyst Professional Certificate) or certifications (e.g., AWS Certified Solutions Architect, Project Management Institute Certified Associate in Project Management) into academic programs that allow students to demonstrate skills and competencies valued by employers



Developing new microcredentials by faculty members to address skills complementary to existing academic degree programs

As an example of incorporating existing programs, institutions such as FIU and the University of Dayton are using microcredentials from the Education Design Lab (the Lab) to highlight employability or soft skills. The Lab has developed microcredentials in collaboration, creative problem solving, critical thinking, empathy, initiative, intercultural fluency, oral communication, resilience, and self-directed learning.<sup>11</sup> To earn each microcredential, students must pass four performance-based assessments.

Microcredentials can also be developed to provide career-focused skills. At SUNY Geneseo, students can connect science topics to communication skills and prepare for professional opportunities through the Integrative Curricular Microcredential in Science Communication.<sup>12</sup> Students earning this microcredential are equipped with the skills and experience to communicate complex scientific issues to individuals without a scientific background. Students must complete nine credits that include one course in science, technology, engineering, or math; one biology course called Communicating Science; and one course from a selection of writing-intensive English courses focused on creative writing, a film studies video production course, or a data visualization and presentation course. In addition to the course work, students complete an internship or directed study program about a science topic that can be presented to the general public through presentations, publications, and podcasts.

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11 "The Lab's 21st Century Skills Micro-Credentials," Education Design Lab, accessed November 16, 2022, <https://eddesignlab.org/microcredentialing/microcredentials>.

12 "Integrative Curricular Microcredentials," Geneseo, The State University of New York, accessed December 1, 2022, <https://www.geneseo.edu/apca/integrative-curricular-microcredentials>.

Microcredentials can also be used to convey specific technical skills that are in demand in the labor market. All students in Western Governors University online Bachelor of Science degree in cloud computing have an opportunity to earn certifications from CompTIA, Axelos, and Linux Professional Institute. In addition, students can select specializations in either AWS or Microsoft Azure and earn additional industry/employer certifications. These certifications are earned as students progress through the degree program, which provides them with more job opportunities both before and after graduation. To ensure that all students can take the certification exams, the cost of the exam is embedded in the tuition.<sup>13</sup>

Since microcredentials can be used in multiple ways, they provide a useful tool for students to gain additional skills that can enhance their labor-market outcomes.

## **CREDIT OR NON-CREDIT**

It is also important to decide if the microcredential will be offered as credit bearing, not for credit, or both. For example, a for-credit microcredential could be developed to stack into a credit-bearing certificate or degree program. This would allow students to continue their education on a defined career pathway. At SUNY Oswego, students can take a Digital Media and Communications Design microcredential either for credit or not for credit. Students who pursue the for-credit microcredential are required to take four classes that cover skills such as website creation, graphic imagery, basic photography, static imagery, and design. The microcredential can be stacked into several bachelor's degrees programs, including a Bachelor of Arts in Communication Studies or a Bachelor of Arts in Art Interaction Design.<sup>14</sup>

Microcredentials are also offered not for credit within higher education institutions as well as offered by industry. The University of Houston (UH) Hewlett Packard Enterprise Data Science Institute (HPE DSI) offers a free data science microcredential for UH students, faculty, and staff. Learners earn the microcredential after taking four HPE DSI courses in data management, Python, data visualization, and machine learning.<sup>15</sup> All courses are delivered synchronously, some courses have prerequisites, attendance is mandatory, and students receive a grade of pass or fail.<sup>16</sup>

Microcredentials can also include employer/industry certificates or certifications. The UT System expanded students' access to professional certificates by entering into a partnership with Coursera.

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13 "Bachelor of Science: Online Cloud Computing Degree," Western Governors University, accessed December 1, 2022, <https://www.wgu.edu/online-it-degrees/cloud-computing-bachelors-program.html>.

14 "Digital Media and Communication Design Microcredential," Oswego, The State University of New York, accessed November 29, 2022, <https://www.oswego.edu/digital-media-and-communication-design>.

15 "Micro-credential in Data Science," Hewlett Packard Enterprise Data Science Institute, University of Houston, accessed January 17, 2023, <https://hpedsi.uh.edu/education/micro-credential-in-data-science>.

16 "Tutorials and Courses," Hewlett Packard Enterprise Data Science Institute, University of Houston, accessed January 17, 2023: <https://hpedsi.uh.edu/education/training>.

As part of this partnership, Coursera provides UT campuses access to professional certificates from companies like Google, HubSpot, IBM, Intuit, Meta, PwC, Salesforce, and SAP. These professional certificates are being embedded in undergraduate degree programs and offered as co-curricular opportunities, and provide options for students to receive credit.<sup>17</sup>

## DELIVERY FORMAT

Similar to courses and degree programs, microcredentials can be designed to be delivered in-person, hybrid, or online. Online microcredentials that are delivered asynchronously allow students to work at their own pace and provide flexibility for the student to fit the work into their schedule. Microcredentials such as those offered by Denver University's Department of Psychology gives students an opportunity to combine in-person courses with experiential learning. Students must focus their microcredential on one of the following topics: diversity and inclusion, data-informed decisions, or mental health.<sup>18</sup> Students then take two required courses and one elective course. The experiential learning project is designed in partnership between the student and the faculty member. The students are then given an opportunity to demonstrate what they learned through the program by developing a portfolio project that is presented to others. And to build communication skills, students must participate in a mock interview that is related to either entry into graduate school or employment.



Photo courtesy of the University of Texas at Arlington

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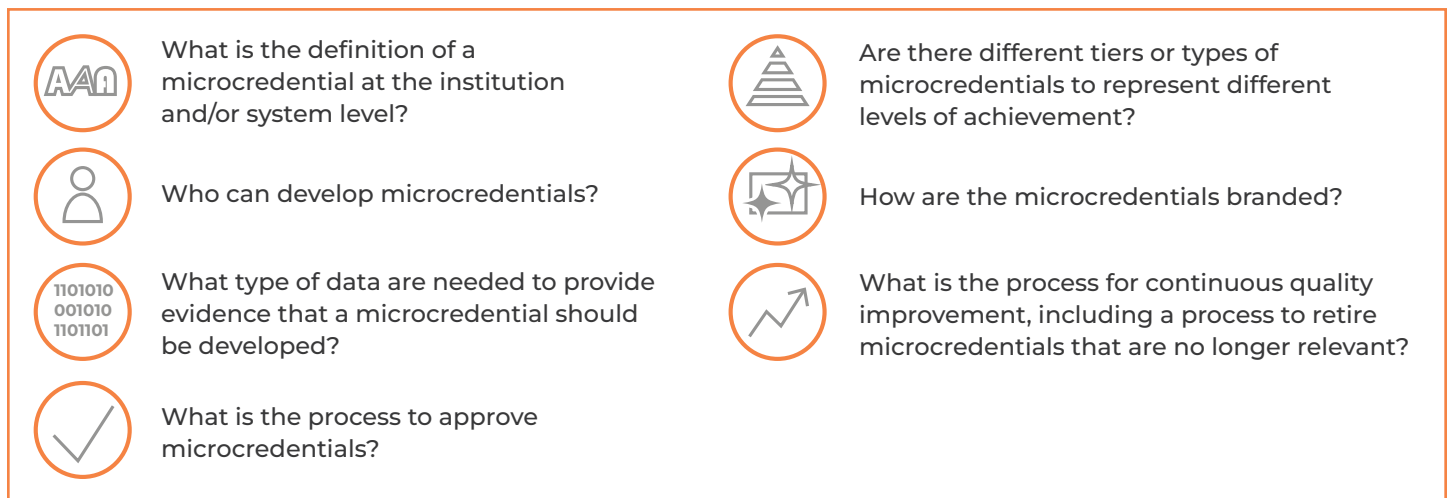
17 Scott Shireman, "Coursera and Google Partner with the University of Texas System to Provide Critical Job Skills to Students Across Eight Campuses," Coursera Blog, December 9, 2022, <https://blog.coursera.org/coursera-partners-with-university-of-texas-system>; "UT System and Google Announce Google Career Certificates for up to 10,000 Texas University Students," The University of Texas System, December 9, 2022, <https://www.utsystem.edu/news/2022/12/09/ut-system-and-google-announce-google-career-certificates-10000-texas-university-students>.

18 "Psychology Micro-Credentials," Department of Psychology, University of Denver, accessed December 1, 2022, <https://liberalarts.du.edu/psychology/academics/psychology-micro-credentials>.

## GOVERNANCE STRUCTURE

To maintain quality and value of microcredentials, universities must establish a governance structure. Several key questions should be considered when determining the governance structure, see Figure 4.

Figure 4: Questions to Consider in Developing the Governance Structure



Universities have approached governance structures in different ways. CU Boulder established a university-wide Micro-credentials Advisory Committee (MAC) to focus on developing the processes to create microcredentials, investigating new learning opportunities, ensuring that different stakeholders understand the purpose and use of the microcredential, and ensuring that microcredentials are inclusive. All microcredentials proposals must be submitted to the MAC and then final approval is granted by the unit or division that proposes the microcredential.<sup>19</sup>

At Kennesaw State University, they developed a set of tools including a microcredential guide, descriptions of four types of microcredentials that represent different levels of achievement, and a guide to propose new microcredentials.<sup>20</sup> Faculty and staff can propose new microcredentials by following a process similar to that for new academic curriculum. Depending on the microcredential issuer, the microcredential is approved by the deans, directors, or college chairs.

In the SUNY system, students and community members have access to more than five hundred microcredentials in more than sixty disciplines.<sup>21</sup> This proliferation of microcredentials developed over time, with SUNY beginning to explore microcredentials in 2015. By 2018, a university-wide task force proposed a set of recommendations to guide the development of microcredentials across the SUNY system. One of the policy recommendations was to develop a definition of microcredentials specific

19 "Micro-Credential Administration," Office of the Registrar, University of Colorado Boulder, accessed November 3, 2022, [https://www.colorado.edu/registrar/faculty-staff/programs/micro-credentials#propose\\_a\\_new\\_micro\\_credential-1323](https://www.colorado.edu/registrar/faculty-staff/programs/micro-credentials#propose_a_new_micro_credential-1323).

20 "Micro-Credentials Overview," Kennesaw State University, accessed November 2, 2022, <https://cia.kennesaw.edu/initiatives/micro-credentials.php>.

21 "Gain New Skills, Knowledge, and Experience with Microcredentials at SUNY," The State University of New York, accessed November 2, 2022, <https://www.suny.edu/microcredentials>.



to SUNY. Their definition is that “SUNY microcredentials verify, validate, and attest that specific skills and/or competencies have been achieved; are endorsed by the issuing institution; have been developed through established faculty governance processes; and are designed to be meaningful and high quality.”<sup>22</sup> Other policy recommendations included creating guiding principles that all campuses should use to develop microcredentials, developing microcredentials to meet the needs of multiple stakeholders, and aligning microcredentials to labor-market needs.<sup>23</sup>

While SUNY has a system-wide approach, it also wanted to ensure that individual campuses had flexibility. As a result, microcredentials are developed by each campus, which has its own policies and procedures. For example, SUNY Binghamton has developed separate approval processes for credit-bearing and non-credit microcredentials. As shown in Figure 5, credit-bearing microcredentials must undergo

**Figure 5: Example of SUNY Binghamton Credit-Bearing Microcredential Review Process**



a seven-step approval process that includes review by (1) the department chair/director, (2) dean/unit head, (3) initial review by the Office of Microcredentials, (4) Undergraduate Education and Enrollment or Graduate Council, (5) Faculty Senate's Education Policy and Priorities Committee, (6) Faculty Senate Executive Committee, and (7) a final review by the Office of Microcredentials.<sup>24</sup>

Within UT Austin, there is a governance structure for its digital badging initiative to ensure consistency among badges issued across the campus.<sup>25</sup> An individual within any college, school, or unit may propose to issue a badge. All proposals are then reviewed by the Badging Review Board (BRB), whose members are experts in the field and selected based on recommendations from the dean's office. If the BRB approves the badge, the badge owner will

22 “Micro-Credential Definition and Terms,” The State University of New York, accessed November 2, 2022, <https://system.suny.edu/academic-affairs/microcredentials/definitions/#d.en.38281>.

23 “Our Story: Building SUNY’s Microcredential Program and Initial Lessons Learned,” The State University of New York, accessed November 2, 2022, <https://www.suny.edu/microcredentials/program-development>.

24 “Microcredentials at Binghamton,” Office of Microcredentials, Binghamton University, State University of New York, updated November 18, 2021, <https://www.binghamton.edu/offices/microcredentials/index.html>.

25 “UT Austin Digital Badging Initiative,” The University of Texas at Austin Extended Education Ventures, accessed November 2, 2022, <https://extendededucation.utexas.edu/ut-austin-digital-badging-initiative>.

enter the information on Badgr, the chosen software platform. Badges can then be issued to individuals who met the criteria. As of 2022, these badges are not recognized on student transcripts and are not awarded college credit.

Though there is not one governance structure that fits every university, one key feature of most is that there is usually a university-wide committee or task force that is charged with developing and implementing a process to award microcredentials. This committee is also usually responsible for developing definitions that will be used either within a campus or a system to ensure consistency of the microcredentials awarded. Finally, if it is a system-wide approach, there is an effort to have a level of flexibility for the individual campuses. Establishing a governance system is a critical component of developing a process to award meaningful and quality microcredentials.

## **INDUSTRY/EMPLOYER RECOGNITION**

As mentioned in the Communicate the Value to Stakeholders section, it is important to validate the skills and/or competencies with employers. Employers can provide feedback on what is needed and whether the skills and competencies continue to be relevant. If the skills' needs have changed, the microcredential can be updated to include the new skills and remove outdated ones, or it can be retired. One example of how a credential can be constantly updated to reflect ever-changing skills needs is with CompTIA certifications. CompTIA develops their certifications with subject matter experts who are practitioners. CompTIA certification exams are revised every three years to ensure that the exams reflect the skills being used in the specific information technology job roles that the certification is for.

When employers value and recognize a microcredential, they might offer internships, work-based learning opportunities, and jobs to holders of the microcredential. Employers could also indicate that a microcredential or the specific skills are preferred on a job posting. By publicly recognizing a microcredential in these ways, employers signal that it is valuable, which in turn has the potential to encourage others to earn and use the microcredential.

## **LEVEL OF RIGOR**

Microcredentials can be offered at all skill levels—introductory, intermediate, and advanced. At the introductory level, the student may be introduced to a concept or can perform rudimentary skills, while at an advanced level the student may be capable of applying the knowledge and skills in a real-world setting. For example, Oregon State University (OSU) offers an online microcredential in Introductory Spanish for students without previous knowledge of the language. Students must

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*MICROCREDENTIALS CAN BE OFFERED AT ALL SKILL LEVELS—INTRODUCTORY, INTERMEDIATE, AND ADVANCED.*

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complete three 4-credit courses to earn the microcredential. Students interested in continuing to study Spanish can apply the twelve credits earned from the microcredential program to OSUs online bachelor's degree program in Spanish.<sup>26</sup>

Other microcredentials provide students the opportunity to learn more advanced skills by progressing through different levels. The University of Maine System developed an Information Literacy microcredential pathway for undergraduate and graduate students comprised of three levels. Level one focuses on foundational information and requires students to complete tutorials and explore resources. Level two requires students to work with a reference librarian, take an information literacy course, complete a quiz, and submit a self-reflection. Level three requires students to submit a final project. All student work is validated by a university library staff member using a rubric adapted from the Association of College and Research Libraries.<sup>27</sup>

## PREREQUISITES

Microcredentials can also be structured with or without prerequisites. Usually, the microcredentials that offer more broad-based skills do not have prerequisites, while those that focus on advanced, technical, or specialized skills require prerequisites. If a microcredential is aligned with a specific degree program, then its prerequisites can build upon skills and knowledge learned in the courses required for the degree program. However, microcredentials with multiple prerequisites may increase a student's time to earn a degree and therefore increase costs unless some of the prerequisites also meet general education requirements for their degree. One of the ways to avoid increasing the student's time and costs is to put the requisite content in the course and sequence the content to build the microcredential.

Some microcredentials, such as those focused on soft skills or employability skills developed by the Education Design Lab, do not have prerequisites. For example, the Lab partnered with George Mason University to develop a microcredential in resilience. Students complete a six module online curriculum and then pass four performance-based assessments. The assessments address the sub-competencies of learning from experience, exhibiting flexibility, demonstrating self-awareness, and focusing on solutions.

On the other hand, prerequisites are required for the Farmingdale State College (part of the SUNY system) for-credit microcredential in Financial Mathematics.<sup>28</sup> To be eligible to pursue this microcredential that focuses on quantitative and computational finance, students must take the Calculus II

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26 "Introductory Spanish – Online Microcredential," Oregon State University, accessed December 5, 2022, <https://ecampus.oregonstate.edu/online-degrees/microcredentials/introductory-spanish>.

27 "Information Literacy," Maine's Public Universities: University of Maine System, accessed December 5, 2022, <https://www.maine.edu/student-success/micro-credentials/list-of-micro-credentials/information-literacy>.

28 "Financial Mathematics," Farmingdale State College, State University of New York, accessed November 29, 2022, <https://www.farmingdale.edu/provost/microcredentials/fin-math-mc.shtml>.






course or its equivalent. Upon successful completion of the required course with a grade of “C” or better, students then take three other courses: Introduction to Financial Mathematics, Continuous Time Finance, and Financial Engineering. Students from all majors except applied mathematics are eligible to enroll in this microcredential.

## PURPOSE

Before deciding whether to create a new microcredential or use an existing one, it is critical to determine its purpose, such as whether it should highlight a specific skill or skill bundle, demonstrate a skill specialization, or convey that a student has applied skills through an experiential learning opportunity. Understanding the purpose will inform some of the other factors discussed in this report, so this is an important step for faculty and staff. Additionally, as other factors are considered, faculty and staff should reflect on how the other factors support the stated purpose of the microcredential.

To help faculty and staff clarify and determine the purpose of the microcredential, Figure 6 outlines some of the key questions that should be answered.

**Figure 6: Questions to Determine the Purpose of a Microcredential**

	What is the skill level the learners will achieve by earning the microcredential?		Are there prerequisites to be eligible to earn the microcredential?
	What skills will the microcredential represent? Why is it important to bundle these skills into a microcredential?		Who do you want to value or recognize the microcredential?
	Is the microcredential going to be embedded in a degree or offered as a co-curricular experience?		

An example of a microcredential that conveys that a student has applied skills through an experiential learning opportunity is the Event Leadership—South Beach Wine and Food Festival (SOBEWFF) microcredential offered at the FIU Chaplin School of Hospitality and Tourism Management.<sup>29</sup> Students demonstrate their event leadership, management, and communication skills by completing an event lead training program and volunteering for at least 35 hours at the SOBEWFF. By earning this microcredential, students can apply what they learned and show potential employers that they have the skills critical to success in the hospitality and tourism industry. This microcredential reflects real-world experience in hospitality, and provides FIU the ability to highlight industry-relevant skills for its students.

29 “Micro-Credentials Catalog,” Office of Micro-Credentials, Florida International University, accessed November 17, 2022, under “Event Leadership—South Beach Wine and Food Festival,” page 2, <https://microcred.fiu.edu/micro-credentials-catalog/index.html#>.

Identifying the purpose of the microcredential is probably the most important factor to consider when developing or adopting a microcredential. If the purpose can be clearly articulated, then it is much easier to address all of the other factors that need to be considered.

## TARGET POPULATION

Microcredentials can be designed to focus on a particular group of learners, such as currently enrolled undergraduate or graduate students, continuing education students, or incumbent workers interested in upskilling in their current occupation or searching for a new career. For example, undergraduate students interested in geographic information systems (GIS) at Northern Kentucky University can earn a microcredential in GIS and Mapping by taking two upper-level undergraduate courses: Geographic Information Systems and Cartography. By completing this microcredential, students learn how to use these systems to develop maps.<sup>30</sup>

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*MICROCREDENTIALS CAN BE DESIGNED TO FOCUS ON A PARTICULAR GROUP OF LEARNERS, SUCH AS CURRENTLY ENROLLED UNDERGRADUATE OR GRADUATE STUDENTS, CONTINUING EDUCATION STUDENTS, OR INCUMBENT WORKERS INTERESTED IN UPSKILLING IN THEIR CURRENT OCCUPATION OR SEARCHING FOR A NEW CAREER.*

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Microcredentials can also be used to enhance the professional skills of graduate students and postdoctoral scholars. The University of California Davis GradPathways Institute for Professional Development offers microcredentials to help these individuals hone skills that will benefit them in their careers. For example, the Presenting Research to the Public Pathway microcredential takes six to ten hours to complete and involves a variety of training, including workshops and competitions, and requires written work submitted for verification.<sup>31</sup> The pathway consists of three microbadges: Presenting to Live Audiences, Communicating Research to Varied Audiences, and Communicating Value and Impact. To earn the full pathway microcredential badge, students must complete two of the microbadges.

Working professionals can also acquire specific skills by earning microcredentials. The University of Pittsburgh Joseph M. Katz Graduate School of Business and College of Business Administration offer a variety of microcredentials, such as Marketing Analytics, Data Programming for Business Insights, and Management Science. The microcredentials typically require 6–9 credits and can be completed in as little as two semesters. To meet the scheduling needs of working professionals, the courses are

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30 "Micro-Credentials: GIS and Mapping," Northern Kentucky University, accessed December 2, 2022, <https://nku.edu/content/www/microcredentials/categories/IT/gis-mapping-undergrad.html>.

31 "Presenting Research to the Public Pathway," GradPathways Institute for Professional Development, UC Davis, accessed December 2, 2022, <https://gradpathways.ucdavis.edu/presenting-research-public>.

offered in-person and online, and on evenings and weekends. Each microcredential can be taken on its own, or they can be stacked into a Katz Graduate Certificate, Master of Business Administration, or Master of Science degree.<sup>32</sup>

## **TIME TO COMPLETION**

Microcredentials can also be earned in different amounts of time. For example, learners enrolling in for-credit microcredentials in the SUNY system typically must complete six credit hours, although for-credit microcredentials can require from 6–16 credit hours. On the other hand, a cybersecurity fundamentals microcredential offered to undergraduate students at FIU can be completed in one semester.

When developing and implementing microcredentials, one factor that should be taken into consideration is how microcredentials can be offered without increasing the time or the cost to earn a degree. One strategy is to explore how a microcredential could be embedded into a specific academic degree program. A benefit of embedding microcredentials early in a student's degree program is that it may improve student retention and provide additional opportunities while working toward their degree. For example, Western Governor's University embeds industry/employer certifications into its information technology (IT) degrees ranging from a Bachelor of Science in computer science or a Bachelor of Science in data management and data analytics to accelerated bachelor's and master's degrees in IT. The costs for the certification exams are included in the tuition and the competencies assessed in those exams are incorporated into the curriculum.<sup>33</sup>

Another strategy to ensure that earning a microcredential does not burden students with additional time and costs is to explore whether skills are already being taught in a course or a series of courses. These skills should be made transparent and create a pathway that the student can follow and articulate to others. If so, a microcredential could be developed to showcase that a student has acquired specific knowledge or skills through those courses. This will require faculty to meet and discuss their courses in detail to ensure that microcredentials are in alignment and appropriately timed in the program pathway. By highlighting specific skills, the student is more aware of what they know and are able to do, while the achievement of the microcredential can signal to employers that individuals have these skills and competencies.

As these sections and examples all show, the flexibility and variability of microcredentials allow colleges and universities to use them to address different skills needs across many disciplines, and therefore ultimately increase their value and usability.

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32 "Micro-Credentials," Joseph M. Katz Graduate School of Business and College of Business Administration, University of Pittsburgh, accessed December 1, 2022, <https://business.pitt.edu/microcredentials>.

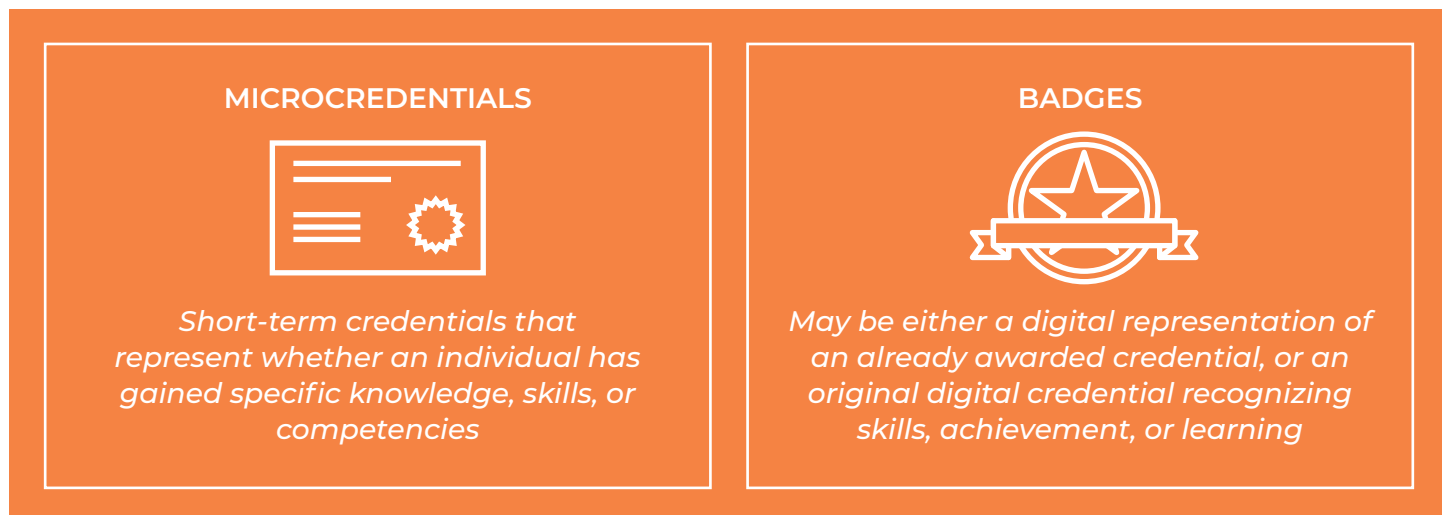
33 "IT Certifications Online—Information Technology Certifications and Degrees," Western Governors University, accessed December 1, 2022, <https://www.wgu.edu/online-it-degrees/it-certifications.html>.

# RELATIONSHIP BETWEEN MICROCREDENTIALS AND BADGES

In general, microcredentials are short-term credentials that represent whether an individual has gained specific knowledge, skills, or competencies. As outlined in Figure 7, a badge may be either a digital representation of an already awarded credential (e.g., a badge can be issued for a certificate earned after completing an online training course) or an original digital credential recognizing skills, achievement, or learning. Both types of badges should have an image (i.e., the visual depiction of the credential) and metadata uniquely linked to the individual's skills. A digital badge also will have an issuer (institution that testifies), an earner (learner), and a displayer (site that houses the badge). Only a badge that is an original credential may be categorized as a microcredential, since the other is just a representation of the actual credential.

Within the UT System, some academic institutions already offer badges, such as completion and competence badges. Completion badges indicate that an individual finished an activity, but do not provide any information about skill attainment. A competence badge includes an assessment or a series of assessments that show whether the learner obtained the knowledge, skills, and abilities in the program. Only a competence badge can be considered a type of microcredential, since it indicates skills achieved. Institutions that are already offering badges can build upon these programs to expand their microcredential offerings due to the versatility of microcredentials and badges.

**Figure 7: Microcredentials vs. Badges**





# COMMONLY IDENTIFIED SKILLS IN LIBERAL ARTS AND DATA ANALYTICS

Employers continue to indicate that they need employees to have a combination of the required technical skills along with soft or employability skills. Liberal arts education programs are frequently associated with developing such employability skills as critical thinking, oral and written communication skills, persuasive storytelling, complex problem-solving, and analytical reasoning. One of the findings from *How College Contributes to Workforce Success: Employer Views on What Matters Most*, a report of survey results from industry executives and hiring managers, is that skills acquired through a liberal arts education are important for success in the workforce.<sup>34</sup>

Simultaneously, many retail, management, finance, sales and marketing, manufacturing, human resources, and other professional and technical occupations have an increased need for employees who have digital skills.<sup>35</sup> These digital skills include the ability to analyze and interpret data and use data to make decisions. This may also include familiarity with data visualization tools (e.g., Tableau, Google Data Studio), programming languages (e.g., Python, R, SQL, Java), cloud computing platforms (e.g., Amazon World Services, Microsoft Azure), and hands-on data analysis (e.g., Excel, Google Sheets).

Microcredentials can be a solution to provide liberal arts majors with some digital skills that are needed by employers. Microcredentials can provide technical skills to college students who major in non-technical areas, thereby enhancing their career and labor-market outcomes.

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34 Ashley Finley, *How College Contributes to Workforce Success: Employer Views on What Matters Most* (Association of American Colleges and Universities and Hanover Research, 2021), <https://dgmg81phhvh63.cloudfront.net/content/user-photos/Research/PDFs/AACUEmployerReport2021.pdf>.

35 Clare Coffey and Ben Watsky, *The Digital Talent Forecast: Mapping the Evolving Role of Digital Skills in a Dynamic Labor Market* (Lightcast, General Assembly, and Whiteboard Advisors), accessed October 20, 2022, <https://lightcast.io/resources/research/digital-skills>.





# PROMISING UNIVERSITY AND MICROCREDENTIAL PRACTICES IN DIGITAL SKILLS AND DATA ANALYTICS

Universities across the country are offering a variety of microcredentials that focus on digital skills and data analytics. These programs include interdisciplinary programs, short-term self-paced online courses, and partnerships with other organizations to offer access to professional certificates and certifications. Some of these programs are highlighted in the following sections.

## **CODING**

Binghamton Codes! is a program offered at SUNY Binghamton for individuals with no coding experience. To earn the microcredential, students take two courses—Introduction to Coding (Python) and Coding in Action—to learn basic programming and data analysis skills.<sup>36</sup> Students must earn a grade of “C+” or higher in both courses to receive credit for this microcredential. Students who have prior coding experience can earn the microcredential by completing only the Coding in Action course. Upon completion, students receive a badge and a notation on their transcript. To meet student demand, both courses are offered every semester.

## **DATA READY!**

The university library at Georgia State University (GSU) offers students, faculty, and staff the opportunity to earn free Data Ready! badges on such topics as Python, R, SAS, SPSS, Tableau, and web scraping. They are also developing a series of three data literacy badges. To earn each co-curricular badge, learners must participate in two or three in-person or online workshops and earn a perfect score on all quizzes. It is estimated that it takes learners 5–7 hours to complete each badge.<sup>37</sup>

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36 “Binghamton Codes!,” Harpur College of Arts and Sciences, Binghamton University, State University of New York, accessed December 2, 2022, <https://www.binghamton.edu/harpur/degrees/binghamton-codes.html>.

37 “GSU Data Ready! Badges Micro-Credentials!,” University Library, Georgia State University, accessed December 6, 2022, <https://research.library.gsu.edu/dataservices/data-ready#badges-faqs>.

## DATA VISUALIZATION

The sociology and anthropology department at Southern Oregon University offers an interdisciplinary microcredential in data visualization that provides students with the knowledge and skills to use basic programming skills and data software programs to build, display, and interpret data sets. Students gain specialized skills by combining courses from sociology and anthropology, business, emerging media and digital arts, and environmental science. To earn the microcredential, students must have a minimum grade of a “C” in the two required and one elective courses, several of which have prerequisites that also meet requirements for students pursuing a Bachelor of Science degree.<sup>38</sup>

## ESSENTIAL TABLEAU SKILLS

The University of Albany in the SUNY system offers an Essential Tableau Skills microcredential designed for business majors that is embedded in an upper-level business information technology course: Data Analytics in Business. The course focuses on the use of predictive analytics and provides students with hands-on opportunities to use Tableau desktop software to analyze data and create data visualizations. As a prerequisite, students must complete two courses before enrolling in the microcredential course.<sup>39</sup>

## PROFESSIONAL INDUSTRY/EMPLOYER CERTIFICATES AND CERTIFICATIONS

There are also opportunities for universities to offer certificates and certifications that are developed by companies, industry associations, and professional associations. Coursera launched Career Academy as a way for universities to offer their students opportunities to earn professional certificates from companies such as Google, HubSpot, IBM, Intuit, Meta, Salesforce, and SAP. The certificates focus on skills in business, data science and analytics, sales and marketing, and software engineering and IT.<sup>40</sup> Some of the certificates are recommended for college credit by the American Council of Education, but it is up to each college or university to determine if they will offer credit for the certificates offered.<sup>41</sup>

Several universities were involved in the Coursera Career Academy pilot program, including the University of Arizona, University of North Texas, and Hawai'i Pacific University (HPU). Business students at

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38 “Data Visualization Micro-Credential,” Southern Oregon University, accessed November 27, 2022, <https://sou.edu/academics/sociology-and-anthropology/programs/data-visualization>.

39 “Explore Our Microcredentials,” University at Albany, State University of New York, accessed March 20, 2023, under “For-credit Microcredentials,” and “Essential Tableau Skills,” <https://www.albany.edu/pack/microcredentials/explore-microcredentials>; “Courses in Information Technology Management,” University at Albany, State University of New York, accessed December 6, 2022, under “B ITM 415/415Z Data Analytics in Business (3),” [https://www.albany.edu/undergraduate\\_bulletin/b\\_itm.html](https://www.albany.edu/undergraduate_bulletin/b_itm.html).

40 “Prepare your students for in-demand jobs with Career Academy,” Coursera for Campus, accessed December 14, 2022, <https://www.coursera.org/campus/career-academy>.

41 “The ACE National Guide,” American Council on Education, accessed December 15, 2022, <https://www.acenet.edu/National-Guide/Pages/default.aspx>.

HPU can enhance their degree by earning professional certificates at no cost through the Career Academy. Each professional certificate is offered in an asynchronous format and can be earned in about 120 hours.<sup>42</sup> Hands-on projects are embedded into each certificate, allowing students to demonstrate that they can apply what they learned and showcase their work to prospective employers.

The UT System also entered into a partnership with the Coursera Career Academy to offer students at its eight academic institutions access to online courses, guided projects, and professional certificates.<sup>43</sup> The UT System also has a partnership with Google to offer students opportunities to earn Google Career Certificates that are either embedded into existing undergraduate degree programs or offered as co-curricular experiences.<sup>44</sup> Students do not have to meet any prerequisites to pursue a Google Career Certificate, which allows students in any academic discipline the opportunity to earn one. Through these opportunities, academic institutions within the UT System are offering students more ways to gain skills that are valued and in high-demand by employers.

Other universities, such as California State University, Fullerton, Florida State University, North Dakota State University, and University of Tampa, have entered into partnerships with SkillStorm, which provides students with opportunities to enroll in online courses taught by SkillStorm instructors.<sup>45</sup> After completing the multi-week course, students are eligible to take a certification exam,



Photo courtesy of the University of Texas at Tyler

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42 Gregory Fischbach, "HPU Partners with Coursera's Career Academy," The 'Ohana: HPU's Daily News, July 25, 2022, <https://www.hpu.edu/about-us/the-ohana/article.php?nid=nc07252201>.

43 Scott Shireman, "Coursera and Google Partner with the University of Texas System to Provide Critical Job Skills to Students Across Eight Campuses," Coursera Blog, December 9, 2022, <https://blog.coursera.org/coursera-partners-with-university-of-texas-system>.

44 "UT System and Google Announce Google Career Certificates for up to 10,000 Texas University Students," The University of Texas System, December 9, 2022, <https://www.utsystem.edu/news/2022/12/09/ut-system-and-google-announce-google-career-certificates-10000-texas-university-students>.

45 "Academic Partnerships: Collaborating With Our Academic University Partners to Close the Technology Skills Gap," SkillStorm, accessed December 11, 2022, <https://skillstorm.com/academic-partnerships>.

which can range in cost from \$600 for AWS Cloud Practitioner, to \$1,600 for CompTIA Security+, to \$2,475 for Pega System Architect. Also through the SkillStorm platform, University of Tampa students in any academic program have access to micro-courses that provide basic knowledge on topics such as Java, mobile app development, and customer relationship management programs like Salesforce. These micro-courses are self-paced and take 20–90 hours to complete, depending on the depth of knowledge of the micro-course.<sup>46</sup>

## THINKING AND COMMUNICATING WITH DATA

Understanding and using data is a critical skill, so FIU developed a free microcredential, Thinking and Communicating with Data, for enrolled students. This foundational microcredential allows learners to demonstrate that they understand data and can use data as evidence to support ideas. Students can earn the microcredential by either enrolling in a math class in which the microcredential is embedded or completing it online.<sup>47</sup>

All of these examples show how universities are creating new opportunities for their students to earn in-demand digital skills that are valued by employers. As a result, students have opportunities to enhance their academic degree that provide broad-based knowledge with specific digital skills that can provide more career opportunities.



Photo courtesy of the University of Texas at San Antonio

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46 “Accelerate Your Future,” Powered by SkillStorm, The University of Tampa, accessed December 11, 2022, <https://ut-catalog.skillstorm.com>.

47 “Critical Skills: Thinking and Communicating with Data,” Florida International University, accessed November 16, 2022, <https://criticalskills.fiu.edu/thinking-and-communicating-with-data/index.html>.



# APPROACHES TO ALIGN DATA ANALYTICS MICROCREDENTIALS WITH ACADEMIC CURRICULUM AND DEGREES

If a microcredential is being designed to be aligned with academic curriculum and degree programs, faculty and administrators have a lot of flexibility in how they can do this. These strategies fall into two main categories: (1) make specific skills already taught as part of a course or academic program more transparent, and (2) add new skills that complement a degree program and can be offered as part of the program or as a co-curricular activity.

## **INCREASE TRANSPARENCY OF SKILLS IN EXISTING COURSES OR DEGREES**

Many in-demand skills may already be taught in a course, a series of courses, or in an academic degree program, but the skills may not be easily articulated by the student or recognized by a prospective employer. In that case, a microcredential could be used to highlight the skills and make them more transparent. For example, microcredentials could be developed to show that a student has a level of competence in a programming language (e.g., Java, Python) visual or analytics platform (e.g., Microsoft Power BI, SAS Visual Analytics, Tableau) that is being taught in an existing course. And depending on the depth of knowledge that students obtain, microcredentials could be developed to indicate different levels of competence that range from foundational to advanced. For example, a set of two courses that focus on coding could be grouped together so that a student who completes those courses earns a microcredential in Python. Or, a microcredential could be offered for a skill such as using and interpreting data that may already be part of a statistics or business analytics class.

## **CREATE NEW MICROCREDENTIALS USING CERTIFICATION EXAM BLUEPRINTS TO INFORM SKILLS**

Data analytics microcredentials can also be developed by identifying specific skills and determining how those skills can be incorporated into the curriculum or offered as co-curricular activities. One way to gather information about skills that are valued by employers is to analyze related certification

exam guides, which may be updated as often as yearly or every three to five years, depending on how quickly skills change in an occupation.<sup>48</sup> These guides provide information about the domains of knowledge that are assessed, how each domain is weighted on the assessment, and the content objectives. Faculty can map the domains of knowledge and content objectives against existing academic curriculum to identify knowledge and skills gaps. Microcredentials could then be developed to address the skills gaps.

## **EMBED DATA ANALYTICS SKILLS IN GENERAL EDUCATION COURSES**

A data analytics microcredential could be embedded into an existing course or courses that is part of the university core curriculum. For example, the FIU Thinking and Communicating with Data microcredential is embedded in specific sections of four math courses: Pre-Calculus Algebra and Trigonometry, Statistics for Business and Economics, Statistics for Behavioral and Social Sciences, and Statistics 2. All of the courses except Statistics 2 meet the university core curriculum requirement, though only one course is needed to earn the microcredential.

## **CREATE A CO-CURRICULAR EXPERIENCE**

Data analytics microcredentials could also be offered as co-curricular experiences by creating seminars, bootcamps, or workshops. These experiences could be offered in any format—online, in person, or hybrid—and would provide students with additional opportunities to enhance their degree with specific career skills. As already discussed, the GSU library offers opportunities to attend workshops on a variety of data analytics topics. Microcredentials are issued upon completion of the workshops and achieving a perfect score on the quizzes.<sup>49</sup>

Industry/employer certificates and certifications could also be offered as co-curricular experiences. Universities can work directly with certification bodies that offer academic partnerships or enter into agreements with organizations such as Coursera and SkillStorm to offer professional certificates and certifications that enhance an academic program.

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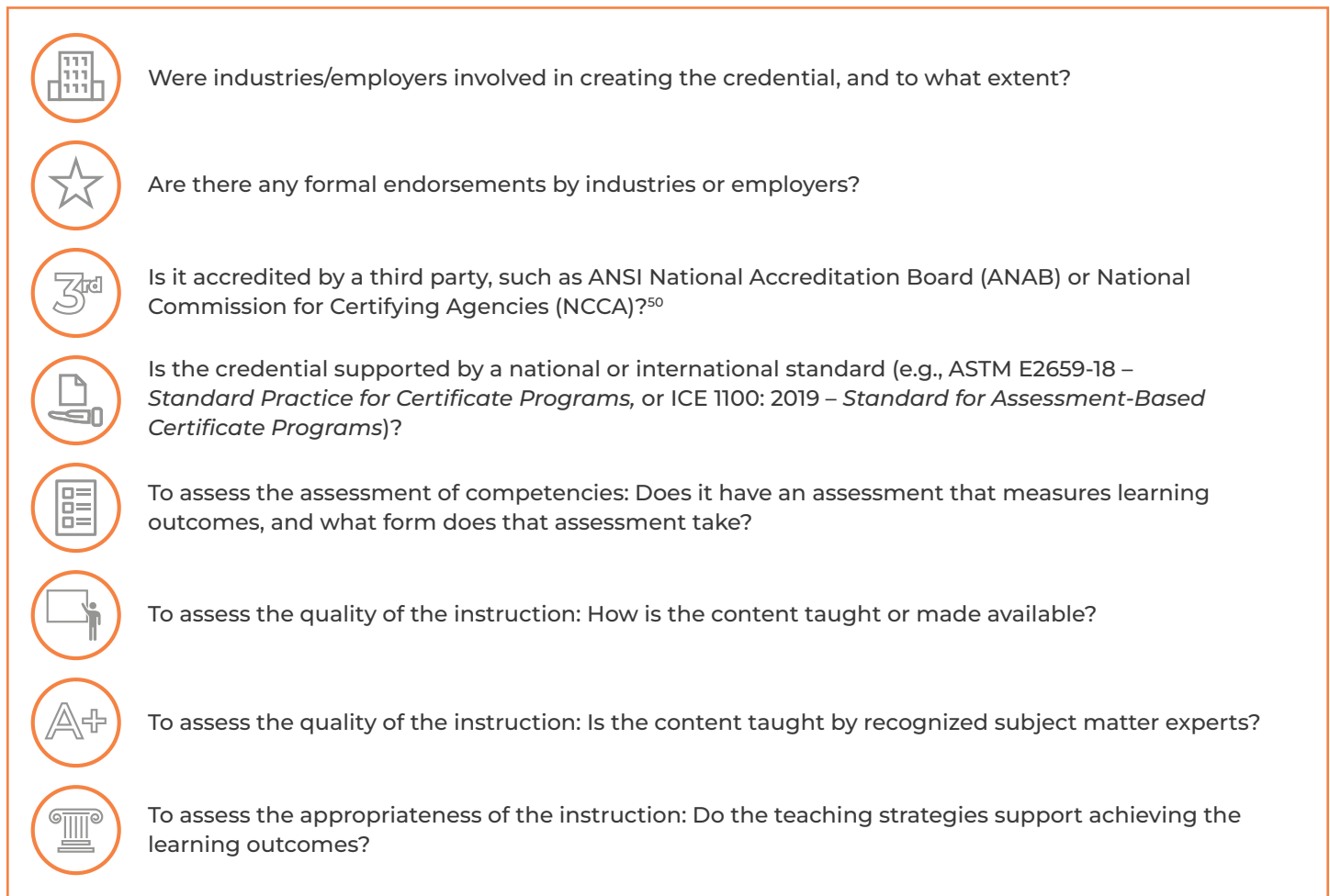
48 Author's Note: Many organizations that offer certifications provide publicly available information about the domains of knowledge and the content that is assessed on the exam. Examples of this information include: [AWS Certified Cloud Practitioner\(CLF-C01\) Exam Guide](#); [CompTIA A+ Certification Exam Core 1 Objectives](#); Project Management Institute's [Certified Associate in Project Management \(CAPM\)® Examination Content Outline](#); and [Study guide for Exam AZ-900: Microsoft Azure Fundamentals](#).









49 "GSU Data Ready! Badges Micro-Credentials!" University Library, Georgia State University, accessed December 6, 2022, <https://research.library.gsu.edu/dataservices/data-ready#badges-faqs>.

## EMBED AN INDUSTRY/EMPLOYER CREDENTIAL INTO AN ACADEMIC DEGREE

In addition to adding industry/employer certificates (e.g., Google Data Analytics Professional Certificate) and certifications (e.g., AWS Certified Cloud Practitioner) as co-curricular activities, they could also be aligned to the curriculum and then embedded into relevant degree programs. One of the challenges with this approach is determining quality industry/employer certificates and certifications. Industry/employer certificates are issued upon the completion of an education or training program, and the following questions in Figure 8 can provide guidance about quality.

Figure 8: Questions to Determine Quality of Industry/Employer Certificates

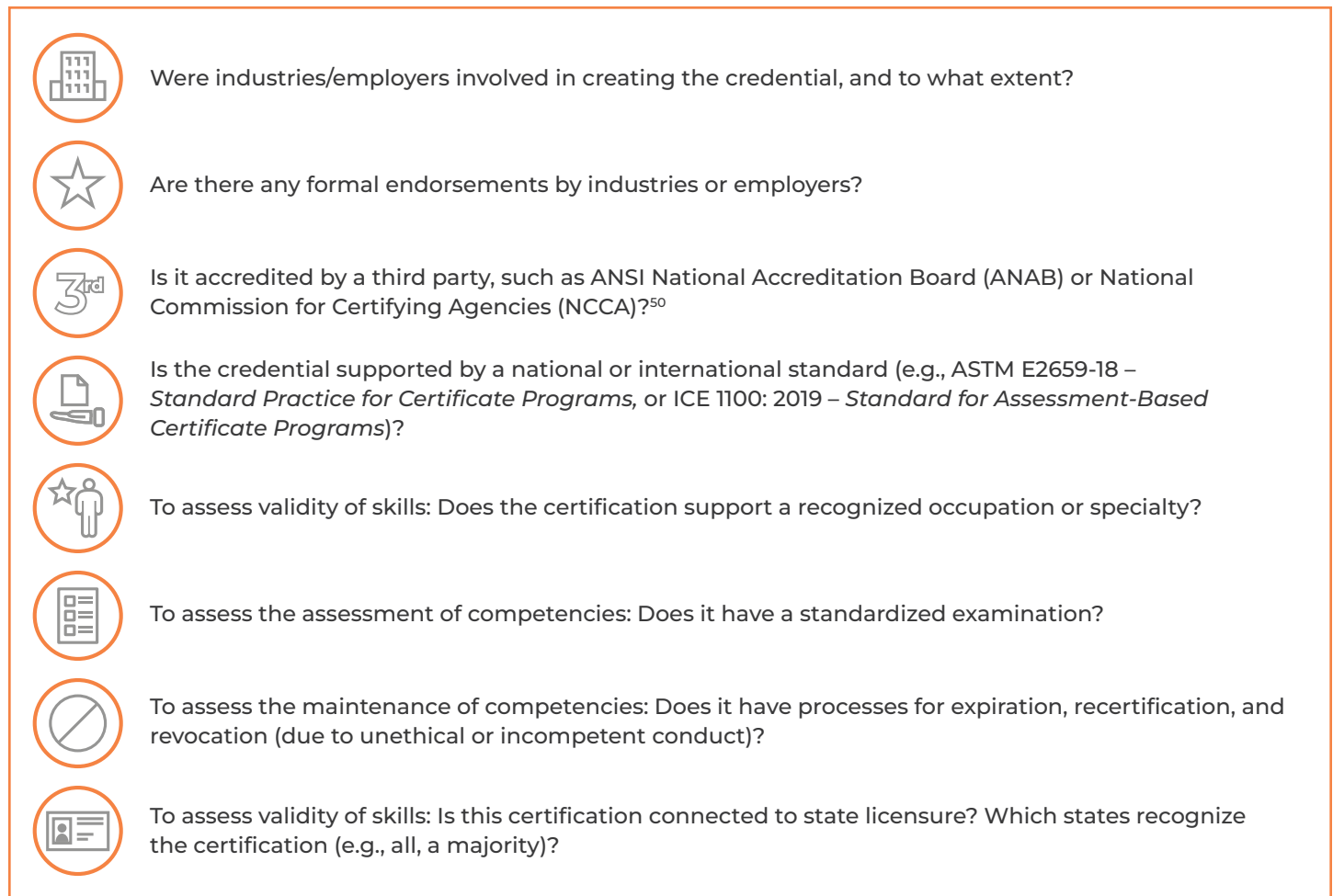










-  Were industries/employers involved in creating the credential, and to what extent?
-  Are there any formal endorsements by industries or employers?
-  Is it accredited by a third party, such as ANSI National Accreditation Board (ANAB) or National Commission for Certifying Agencies (NCCA)?<sup>50</sup>
-  Is the credential supported by a national or international standard (e.g., ASTM E2659-18 – *Standard Practice for Certificate Programs*, or ICE 1100: 2019 – *Standard for Assessment-Based Certificate Programs*)?
-  To assess the assessment of competencies: Does it have an assessment that measures learning outcomes, and what form does that assessment take?
-  To assess the quality of the instruction: How is the content taught or made available?
-  To assess the quality of the instruction: Is the content taught by recognized subject matter experts?
-  To assess the appropriateness of the instruction: Do the teaching strategies support achieving the learning outcomes?

50 Author's Note: For more information about accreditation, visit the ANSI National Accreditation Board (ANAB) website: <https://anab.ansi.org/credentialing>, and the National Commission for Certifying Agencies (NCCA) website: <https://www.credentialingexcellence.org/Accreditation/Earn-Accreditation/NCCA>.

Unlike industry/employer certificates, industry/employer certifications are not associated with education and training. They are usually issued by employers; professional, trade, and industry associations; or non-profits. Certifications tend to have three distinct elements: (1) a third-party assessment that can be oral, written, or performance-based; (2) it is time-limited and can be renewed; and (3) it can be revoked for a violation of a code of ethics (if applicable) or proven incompetence after due process. The questions in Figure 9 provide guidance to determine if an industry certification has quality.

**Figure 9: Questions to Determine Quality of Industry/Employer Certifications**



-  Were industries/employers involved in creating the credential, and to what extent?
-  Are there any formal endorsements by industries or employers?
-  Is it accredited by a third party, such as ANSI National Accreditation Board (ANAB) or National Commission for Certifying Agencies (NCCA)?<sup>50</sup>
-  Is the credential supported by a national or international standard (e.g., ASTM E2659-18 – *Standard Practice for Certificate Programs*, or ICE 1100: 2019 – *Standard for Assessment-Based Certificate Programs*)?
-  To assess validity of skills: Does the certification support a recognized occupation or specialty?
-  To assess the assessment of competencies: Does it have a standardized examination?
-  To assess the maintenance of competencies: Does it have processes for expiration, recertification, and revocation (due to unethical or incompetent conduct)?
-  To assess validity of skills: Is this certification connected to state licensure? Which states recognize the certification (e.g., all, a majority)?



# A FRAMEWORK TO DEVELOP AND INTEGRATE MICROCREDENTIALS INTO UNDERGRADUATE EXPERIENCES

Even though many colleges and universities are exploring adding microcredentials to their curriculum, at this time, there is not a standard approach or system to guide the creation and implementation of microcredentials. To help with this, Workcred partnered with the UT System to draft a framework to provide general guidance on the process to develop and implement microcredentials (see Figure 10). Based on the input from participating UT System representatives, the following framework was developed, which includes key elements necessary to build a microcredential from conceptualization to delivery. This is not a linear process, but instead requires multiple efforts to occur simultaneously.

**Figure 10: A Framework to Develop and Integrate Microcredentials into Undergraduate Experiences**



## BUY-IN

One element that cuts across all four pillars of the framework is the importance of obtaining buy-in or support for the microcredential. At the beginning of the process, it is important to obtain buy-in from university leadership to ensure that the concept of microcredentials is supported and that microcredentials have defined relationships with other credentials being offered. Initial buy-in is dependent on demonstrating that there is a need for the microcredential, which can be determined through a needs assessment. In

addition to university buy-in, it is also necessary to get support from the department that is going to offer the microcredential, as well as other departments that may be impacted, especially if the microcredential is interdisciplinary. It is critical that faculty and administrators understand the purpose of the microcredential and the intended benefits for students. For the microcredential to be sustainable, faculty and staff will need to promote it to students.

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*ONE ELEMENT THAT CUTS ACROSS ALL FOUR PILLARS OF THE FRAMEWORK IS THE IMPORTANCE OF OBTAINING BUY-IN OR SUPPORT FOR THE MICROCREDENTIAL.*

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## CONDUCT A NEEDS ASSESSMENT

A needs assessment is important to determine the in-demand skill needs that the microcredential will cover and to develop a rationale for the university, faculty, staff, students, and employers to support the microcredential. The needs assessment could be conducted by faculty or external vendors and could include employer focus groups. The purpose of the assessment should be to determine in-demand skill needs in the local, regional, or national labor market. By identifying the skills that are in demand, university faculty can assess whether those skills are already offered in the curriculum. A microcredential could then be developed to either bring greater attention to skills that are offered in the curriculum or to provide new skills. By obtaining evidence of need, it will be easier to obtain buy-in and justify the effort that will be required to develop the microcredential.

The cost to develop the microcredential should also be part of the needs assessment. What are the financial, staff, and marketing resources required to develop the microcredential? Who is responsible for developing the curriculum? What are the strategies to promote the microcredential to students and who will be responsible? These questions should be considered so that there is a clear understanding of what it will take to develop and sustain the microcredential.

Another part of the needs assessment should be to determine if there is a target population for the microcredential. As detailed earlier in this report, microcredentials can be developed for all students or for subsets of students, depending on what the needs are.

Finally, the needs assessment should include a process to benchmark the proposed microcredential against existing programs at other colleges and universities. Benchmarking provides information

about the policies and processes that other institutions use to develop, implement, and sustain their microcredential programs (see Figure 11). This information can be used to inform and improve the development and quality of the microcredential.

**Figure 11: Types of Information That Can Be Gathered During the Benchmarking Process**



Conducting a needs assessment will provide the data and evidence necessary to determine if there is value in developing a microcredential, and this value should be assessed from the perspective of both the student and the employer.

## **BUILD THE TEAM**

Identifying the team members who are responsible for developing and implementing the microcredential is another key effort. The team is dependent on the type of microcredential that is being developed. One academic department could take the lead, or it may be an interdisciplinary approach. The team will need to conduct a high-level curriculum design, which should include the level of the microcredential and whether it will be knowledge-based or competency-based and the type of assessment to be used.

If the purpose of the microcredential is to convey that a student has a specific skill, then the assessment needs to ensure that it is measuring the correct information. For example, a knowledge-based microcredential would have an assessment that measures whether the learner achieved the intended learning outcomes. For a competency-based microcredential, the assessment must measure that the learner achieved the competencies.

Many universities have programs and research centers that can provide guidance and expertise on research methods, test and measurement, and data analytics. One example is the UT Tyler's Research Design and Data Analysis Lab, which has the ability to create generic content for data analytics microcredentials that could be used by faculty members at other UT System institutions to create data

analytics microcredentials for their students.<sup>51</sup> Also, many universities have master's or Ph.D. programs in fields such as educational measurement, quantitative psychology, or statistics, where their faculty or students could provide guidance about developing effective assessments.

## **DEVELOP/ADOPT THE MICROCREDENTIAL**

Based on the outcomes of the needs assessment, the team needs to decide to either develop the curriculum and processes to build a new microcredential or identify an existing microcredential that can be adopted. If the team decided to create the curriculum for a new microcredential, they should determine if the microcredential should be aligned with any external standards, frameworks, or resources. For example, the National Institute of Standards and Technology's National Initiative for Cybersecurity Education (NICE) *Workforce Framework for Cybersecurity (NICE Framework)* provides task, knowledge, and skill statements that could be used to identify what a learner should know and be able to do after completing a cybersecurity microcredential.<sup>52</sup>

In some cases, the skills that faculty want to convey to students may already be part of an existing microcredential that has been developed by a company or industry association. For example, bachelor's degree programs in information technology or business could align their curriculum with the competencies in the Project Management Institute's Certified Associate in Project Management (CAPM)<sup>®</sup>. Faculty would need to align the competencies in the certification exam with the learning objectives in the curriculum. If there are any gaps, then the curriculum could be modified to ensure that students gain the skills and competencies necessary to successfully pass the certification exam.

To ensure that there is a standard structure and approach, university systems and/or academic institutions should develop guiding principles and governance structures about how to develop, implement, and approve microcredentials. As discussed in the section on governance structure, guiding principles should address a variety of issues that may include: microcredential definitions; policies and processes that cover development and implementation of microcredentials; university branding; evidence required to support the need for a microcredential; and policies to address microcredentials that are out-of-date.

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*TO ENSURE THAT THERE IS A STANDARD STRUCTURE AND APPROACH, UNIVERSITY SYSTEMS AND/OR ACADEMIC INSTITUTIONS SHOULD DEVELOP GUIDING PRINCIPLES AND GOVERNANCE STRUCTURES ABOUT HOW TO DEVELOP, IMPLEMENT, AND APPROVE MICROCREDENTIALS.*

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51 "Research Design and Data Analysis Lab," Office of Research, Scholarship, and Sponsored Programs, University of Texas at Tyler, accessed November 17, 2022, <https://www.uttyler.edu/research/ors-research-design-data-analysis-lab>.

52 Rodney Petersen, et al., *Workforce Framework for Cybersecurity (NICE Framework)*, NIST Special Publication 800-181, Revision 1 (2020), <https://doi.org/10.6028/NIST.SP.800-181r1>.

It is also critical to create a plan about how students and employers will be informed about the microcredential. Students need to understand the knowledge, skills, and competencies that can be acquired by earning the microcredential and where those skills are valued in the labor market. Employers need to understand that students who earn the microcredential will have skills that they need in their workforce.

If the microcredential is developed or adopted by one institution within a system, there should also be considerations on whether there are opportunities to offer the microcredential at other institutions. The microcredential could be adapted by faculty at other campuses to make it more relevant to their learners or it could be offered as it was originally designed. Also, there could be opportunities for centers or labs that have a specific content expertise to develop the framework or the actual microcredential and share it with institutions throughout a system.

## **DELIVER THE MICROCREDENTIAL**

Once the microcredential is developed by faculty or adopted from an external organization, the process of enrolling students begins. Just because the microcredential is in the course catalog does not mean that students will enroll. The team should employ their communications plan that was developed to actively make students aware of the microcredential and encourage enrollment. These outreach activities will vary depending on whether the microcredential is available to all students or to a particular subset of students, and can include conducting a social media campaign, gathering



stories and endorsements from employers about the value of the skills in the microcredential, creating short videos, educating career counselors, having faculty promote the credential in relevant courses, and including information on department websites.

Relationships should be built with employers throughout process, continuing through the needs assessment, development, implementation, and assessment of the microcredential. If the goal is for employers to value and recognize the microcredential as a signal of learners' skills, then they need to understand the knowledge, skills, and competencies that are assessed, and want to employ individuals that possess them.

## **ASSESS THE EFFECTIVENESS AND VALUE OF THE MICROCREDENTIAL**

Finally, there should be a continuous quality improvement process that assesses and evaluates the effectiveness of the microcredential. As the team obtains all the necessary approvals at the department, college, institution, and/or system levels for development or adoption of the microcredential, the team should also develop a plan to assess and measure metrics of success. The team can use existing process- and/or outcome-based frameworks or create their own framework by adapting relevant pieces of existing frameworks. Organizations such as Education Quality Outcomes Standards (EQOS), National Skills Coalition, and Rutgers Education and Employment Research Center have developed either outcome-based or a combination of outcome-based and process-based quality assurance frameworks.<sup>53</sup> Examples of the types of individual-level outcomes that these frameworks include are credential attainment, employment after completion, satisfaction with the credential, and wage changes after completion.

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*DATA SHOULD BE COLLECTED SO THAT IT CAN INFORM THE VALUE OF THE MICROCREDENTIAL TO STUDENTS, THE UNIVERSITY, AND EMPLOYERS.*

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Data should be collected so that it can inform the value of the microcredential to students, the university, and employers. The assessment and evaluation of the microcredential should include discussions of whether it should continue to be offered or whether it should be retired. This is especially important in technical skills, which may quickly become outdated. Each university system and its academic institutions should develop a process that is aligned with their institutional practices and policies. Identifying metrics is critical so that there is a way to assess whether the microcredential is meeting its intended purpose(s) and continues to be valuable.

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53 Author's Note: For more information about quality assurance frameworks, see the JFF "[Education Outcomes Quality Standards \(EQOS\)](#)" webpage; the EQOS [Quality Assurance Standards Framework and Outcomes Metrics](#) report; the National Skills Coalition "[Expanding Opportunities: Defining Quality Non-Degree Credentials for States](#)" webpage; and the Rutgers School of Management and Labor Relations Education and Employment Research Center [Non-Degree Credential Quality: A Conceptual Framework to Guide Measurement](#) publication.



# ASSETS TO SUPPORT MICROCREDENTIALING EFFORTS IN THE UT SYSTEM

Academic institutions in the UT System have a number of assets that can facilitate the development and adoption of microcredentials that support students' career and labor-market goals. Support at the UT System level is evident through the launch of their microcredentialing effort, Texas Credentials for the Future, and partnerships with Google and Coursera, where UT System institutions are currently testing how to incorporate microcredentials into academic degrees.<sup>54</sup> These programs include integrating Google Career certificates in data analytics into psychology and sociology majors at UTEP; Amazon Web Services Cloud Practitioner certification for English, history, and design majors at UT Austin; and Adobe Certified Professional certification for studio arts majors at UT Arlington.<sup>55</sup>

The UT System also provides labor-market resources that can be used to inform the need to create a microcredential. The UT System Texas Labor Market Dashboard provides real-time labor market data derived from job postings that can be analyzed by occupation and skills, growth and location quotient, and certifications by occupation family and group.<sup>56</sup> Faculty and staff also have access to the Texas Workcred Development Toolkit, which was created by the Brookings Institution using data provided by The Texas Higher Education Coordinating Board, Texas Workforce Commission, and Lightcast (formerly EMSI Burning Glass). The toolkit allows users to gather information about job quality and demand in all of the Texas workforce regions.<sup>57</sup>

All of the UT System institutions have internal resources that can be leveraged to support the creation and implementation of microcredentials as well. The Office of Research, Scholarship, and Sponsored Programs Research Design and Data Analysis Lab at UT Tyler has the ability to develop curricula for

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54 Author's Note: The UT System is a recipient of the Strada Education Network's [Beyond Completion Challenge](#), which is funding eight institutions to integrate microcredentials into two academic degree programs.

55 "Microcredential Offerings," The University of Texas System, accessed January 17, 2023, <https://www.utsystem.edu/sites/microcredentials/microcredential-offerings>.

56 "The Texas Labor Market Dashboard," The University of Texas System, accessed December 5, 2022, <https://data.utsystem.edu/FutureOfWork>.

57 "Texas Workforce Development Toolkit," Texas Higher Education Data, accessed December 5, 2022, <http://www.txhighereddata.org/index.cfm?objectid=277C9F70-A45B-11EB-8A820050560100A9>.

data analytics microcredentials that could be used or adapted by other institutions. Some institutions also have test and measurement experts who could provide guidance to develop assessments for competency-based microcredentials. There is also the badging initiative governance structure that UT developed to ensure consistency across institutions that could be used as a model for microcredentials as well.

With the support from the UT System, institutions are well-positioned to begin developing or adopting microcredentials that enhance existing degree programs and provide students with additional opportunities to be broadly educated and specifically skilled.



Photo courtesy of the University of Texas at El Paso