American Council on Education®

Quality Dimensions for Connected Credentials

ACE and the American Council on Education are registered marks of the American Council on Education and may not be used or reproduced without the express written permission of ACE.

American Council on Education
One Dupont Circle NW
Washington, DC 20036

© 2016. Readers are welcome to reproduce and disseminate this document for non-commercial use.

Quality Dimensions for Connected Credentials

Deborah Everhart, *Georgetown University (DC)*
Evelyn Ganzglass, *Center for Law and Social Policy (CLASP)*
Carla Casilli, *OpenWorks Group*
Daniel Hickey, *Indiana University*
Brandon Muramatsu, *Massachusetts Institute of Technology*

ACKNOWLEDGMENTS

The American Council on Education provided the oversight and guidance for this project, particularly Deborah M. Seymour, Steven Taylor, and Brice Struthers. This work would not have been possible without support from the Bill & Melinda Gates Foundation and feedback from their experts: Jason Palmer, Stacey Clawson, and Jim Ptaszynski.

The authors would like to acknowledge the many contributors to this work. In particular, we thank Mike Abbiatti (Western Interstate Commission for Higher Education/ Western Cooperative for Educational Technologies) for leading a sub-team and pulling in additional experts. Special thanks to Marie Cini (University of Maryland University College) for contributing specific calls to action for the conclusion. Also special thanks to Thomas Skalko (Commission on Accreditation of Allied Health Education Programs) for his analysis of the quality dimensions of licenses and certifications. Participants in the working group that formulated this research and contributed content were Mike Abbiatti, Rob Abel (IMS Global Learning), Melanie Booth (Western Association of Schools and Colleges Senior College and University Commission), Malcolm Brown (EDUCAUSE), Carla Casilli (OpenWorks Group), Natasha Cornell (New York University), Deborah Everhart (Georgetown University [DC]), Jonathan Finkelstein (Credly) Evelyn Ganzglass (Center for Law and Social Policy), Jenny Hammock (National Retail Federation), Andrew Hanson (Georgetown University Center on Education and the Workforce), Daniel Hickey (Indiana University), Peter Janzow (Pearson), Walt Jimenez (ProExam), Paul LeBlanc (Southern New Hampshire University), Charla Long (Go Long Consulting), Mary Alice McCarthy (New America), Desla Mancilla (AHIMA Foundation), Eric Martin (Higher Learning Commission), George Payne (Montgomery College [MD]), Michael Reilly (American Association of Collegiate Registrars and Admissions Officers), and Thomas Skalko (Commission on Accreditation of Allied Health Education Programs). Additional content, expertise, and feedback were contributed by Katherine Davis (North Carolina Community College System), Michele Forte (State University of New York, Empire State College), Mary Hendrix (Texas A&M University–Commerce), Sally Johnstone (Western Governors University), Ron Legon (Quality Matters), Mimi Maduro (MetaSkills), Dick Senese (Capella University), Marc Singer (Thomas Edison State College [NJ]), Peter Smith (Kaplan) and Nan Travers (State University of New York Empire State College).

CONTENTS

Introduction — 1

What Are Credentials? — 5

Collective Impact for Connecting Credentials — 9

Key Stakeholders — 15

Dimensions of Quality for Connected Credentials — 21

Describing the Current State of Credential Types — 27

Challenge Questions for Analyzing Credentials and Visualizing Potential Futures — 39

Conclusion: Call to Action — 45

References — 47

Introduction

Photo courtesy of ACE member institution Union Institute and University (OH).

The current credentialing ecosystem in the United States developed over time to meet the needs of society and economic structures in which often a single credential served an individual well for a stable career over a lifetime. But today's economy and society depend on ever-higher levels of knowledge and the ability to rapidly evolve and adapt to changing circumstances. Credentials have proliferated to meet the needs of the diverse twenty-first century knowledge economy. For example, over 26,000 educational programs in the United States now offer certificates (McCarthy 2014, 16), and sub-baccalaureate certificates represent over 25 percent of all U.S. postsecondary credentials (McCarthy 2014, 6). Associate degrees have doubled since 2002 (Lumina Foundation 2015b). The share of workers licensed by states has increased five-fold since the 1950s, and now more than 25 percent of workers require licensure to do their jobs (U.S. Department of the Treasury Office of Economic Policy, U.S. Council of Economic Advisers, and U.S. Department of Labor 2015, 3).

But the diversity of credentials is not always meeting the needs of students, educational institutions, and employers, and unfortunately the proliferation of credentials is causing confusion. There is a lack of shared understanding about what makes credentials valuable, how that value varies across different types of credentials for different stakeholders, what constitutes quality, and how credentials are connected to each other and to opportunities for the people who have earned them.

This paper has been produced by the American Council on Education's (ACE) Center for Education Attainment and Innovation as part of the

Credentials have proliferated to meet the needs of the diverse twenty-first century knowledge economy.

Alternative Credit Project supported by the Bill & Melinda Gates Foundation.[1] It provides context for higher education decision makers by describing the problems caused by fractured credentialing systems, articulating quality dimensions that help to address these problems, and visualizing how institutions can improve their credentials to increase their value while meeting the needs of diverse stakeholders.

ACE convened dozens of experts to analyze the issues related to connecting credentials as well as to articulate the dimensions of quality that support healthy ecosystems of connected credentials. The resulting work documented here acts as a complement to other initiatives aimed at improving credentialing systems (see the section on collective impact, below). This paper is closely related to another resource from the ACE Center for Education Attainment and Innovation, *Communicating the Value of Competencies* (Everhart, Bushway, and Schejbal 2016), which focuses on how to improve communication of the value of competencies among educational institutions, students, and employers. These papers are related because connected credentials are premised on two foundational concepts: that the competencies a credential represents should be clearly defined, and that these competencies can carry independent value, including the possibility of individual competencies having currency value as very granular credentials. The competencies paper dovetails with this paper in that understanding and improving the value of connected credentials is directly applicable to communicating the value of competencies (and vice versa). Therefore, improving the value of competencies is a targeted set of approaches in the broader context of improving the value of credentials. Definitions, concepts, and the dimensions of quality are shared across these two papers, with different focuses.

Improving the value of competencies is a targeted set of approaches in the broader context of improving the value of credentials.

There is much to be gained by connecting credentials. The highly diverse array of credentials reflects the strengths and ingenuity of U.S. education, training, and professional development systems. Many creative credentialing approaches are emerging, but they are not being systematically applied. These innovations could potentially scale and evolve to help increasing numbers of people gain the competencies they need for successful careers, contributions to communities of practice, and solving problems large and small. However, this potential depends on stakeholders' ability to find, understand, and utilize

1 This work would not have been possible without support from the Bill & Melinda Gates Foundation. This material is based on research funded in part by the Bill & Melinda Gates Foundation. The findings and conclusions contained within are those of the authors and do not necessarily reflect positions or policies of the Bill & Melinda Gates Foundation.

the right credentials for the right people at the right time. Today, stakeholders experience numerous critical problems:

- Students do not always have reliable ways to compare credentials with regard to what they include, their market value, their transferability, their relationship to other credentials, and other important factors.
- Educational institutions need well-defined information about the value of their credentials for employment, career advancement, civic engagement, and other desired outcomes in order to attract students and guide them to successful credential attainment.
- Employers have difficulty understanding the competencies potential employees may or may not have mastered through the credentials they have earned.

In the context of these and other problems, there are increasing calls for more connected and transparent practices that can improve the value of credentials for all stakeholders. Clear benefits include:

- Enhancing the portability of credentials to support student advancement
- Informing student decision making about which credentials to pursue
- Providing context for educational institutions to make appropriate investments in developing and enhancing credentials
- Increasing employers' trust in and use of credentials in their human resource processes

Approaches to quality connected credentials more appropriately emerge from within communities of practice.

Many organizations are already contributing to initiatives to support connected credentials—for example:[2]

- Defining common language to profile the types and levels of knowledge and skills credentials represent, enabling explicit description of the relationship between one credential and other credentials
- Using clearly defined descriptors to characterize credentials with regard to market value, transfer value, assessment rigor, third-party approval status, and more, empowering institutions to publicize the characteristics of their credentials
- Providing students with clear milestones based on modular components of credentials and relationships among credentials, helping them to understand and document their progress over time along career pathways

2 See the collective impact section, below. ACE is a co-sponsor of Connecting Credentials. It is also represented on the Executive Committee of the Credential Transparency Initiative.

Who leads these changes? A top-down or "authoritative requirements" approach is not desirable, and in fact, probably would not work, given the diversity of credentialing. Approaches to quality connected credentials more appropriately emerge from within communities of practice. The framing premise of this paper is that higher education leaders and decision makers are well-positioned to contribute to national initiatives already underway and improve their own credentials in ways that are appropriate for their institutions and communities. As the Connecting Credentials Initiative states:

> *Key stakeholders agree: Reshaping the nation's fragmented credentialing system is critical to position students, employers and our economy for a successful future. . . . But change can't come from the top down or the outside in. Solutions must emanate from the users and issuers of credentials.* (Lumina Foundation 2015b, 6)

This paper provides context for understanding connected credentials and structure for analysis of credentials. It is intended to help higher education decision makers analyze the connectedness of credentials an institution already provides, those it is considering developing, and/or those to which it connects or plans to connect through articulation, transfer, credit for prior learning, career pathways, and/or education-to-employment bridges. As context for this analysis, this paper includes:

- Definitions of types of credentials
- Context for understanding connected credentials
- Descriptions of credential stakeholders
- Six dimensions of quality that support connected credentials (transparency, modularity, portability, relevance, validity, and equity)
- Descriptions of types of credentials with regard to how they address the quality dimensions
- Challenge questions to stimulate discussion and visualize potential futures for enhancing the quality connectedness of credentials

It concludes with a call to action.

What Are Credentials?

Photo courtesy of ACE member institution Shenandoah University (VA).

KEY DEFINITIONS

What are credentials? The most common higher education academic credentials are associate, bachelor's, and graduate degrees. But U.S. postsecondary credentials include thousands of different certificates, certifications, licenses, and increasingly also badges. Therefore, in order to provide a framework for understanding connected credentials, we need to define what we mean by "credentials."

The framing definition of credentials in this paper comes from the Connecting Credentials Initiative:

> **Credential:** "A documented award by a responsible and authorized body that has determined that an individual has achieved specific learning outcomes relative to a given standard. Credential in this context is an umbrella term that includes degrees, diplomas, licenses, certificates, badges, and professional/industry certifications" (Lumina Foundation 2015a, 11).

Following from this, it is necessary to define each of the types of credentials listed:

> **Degree:** Academic degrees in the United States are credentials awarded by accredited, postsecondary, educational institutions based on the student's completion of a specified program of study. There are basically four levels of degrees: associate, bachelor's, and graduate (master's and doctoral). Although there is considerable variation in requirements depending on the institution and field of study, the associate-level

U.S. postsecondary credentials include thousands of different certificates, certifications, licenses, and increasingly also badges.

degree usually requires the completion of approximately 60 semester credits (approximately two years of full-time study), and the bachelor's level degree usually requires 120 to 130 semester credits (approximately four years of full-time study, including some specialization). The bachelor's degree is generally considered the gateway to graduate degrees and advanced studies. Graduate degrees vary based on specialization, but a master's degree usually requires an additional one to two years of full-time study beyond a bachelor's, and a doctoral degree approximately four years beyond a bachelor's.

Diploma: "An official document issued by an educational institution that records the achievements of an individual following the successful completion of an academic course of study, typically requiring fewer credits than an associate degree" (Lumina Foundation 2015a, 11).

Certificate: "A credential awarded by a training provider or educational institution based on completion of all requirements for a program of study, including coursework and tests or other performance evaluations. Certificates are typically awarded for life (like a degree). Certificates of attendance or participation in a short-term training (e.g., one day) are not in the definitional scope for educational certificates" (Bielick et al. 2013, 5).

Certification: "A credential awarded by a certification body based on an individual demonstrating through an examination process that he or she has acquired the designated knowledge, skills, and abilities to perform a specific job. The examination can be either written, oral, or performance-based. Certification is a time-limited credential that is renewed through a recertification process" (Bielick et al. 2013, 5).

License/Licensure: "A process by which a governmental agency grants time-limited permission to an individual to engage in a given occupation after verifying that he or she has met predetermined and standardized criteria. Practice in a licensed occupation is restricted to those possessing a license. The requirements for licensure vary by state, based on legislative and regulatory requirements" (Lumina Foundation 2015a, 12).

Badge: Badges use digital technologies to represent learning achievements; however, not all *digital* badges are *open* badges, in that not all badges use open standards that support interoperability and connections among systems and contexts. In this paper, "badge" refers to "open badges" and therefore includes technical and conceptual

frameworks for openness, transparency, and interoperability (for more context on open badges, see Derryberry, Everhart, and Knight 2016). "Badges signify accomplishments such as completion of a project, mastery of a skill, or marks of experience" (Casilli and Knight 2012, 1) and can be created and awarded by institutions, organizations, groups, or individuals. Badges are flexible with regard to how issuers create them, define their use, and develop their criteria (which are publicly viewable, embedded in the badge, and verifiable). Therefore badges can be used in numerous ways to meet a community's needs, to represent granular competencies as well as deeply linked, rich experiences and complex learning. Badges are being used in conjunction with and/or as modular components of traditional credentials such as degrees. In some cases, especially when badges link to evidence, they are being used as representations of credentials. Badges can expire or be revoked, making them useful for credentials that are not continuously valid. Given their flexibility, badges bridge traditional, accredited credentials, professional and industry-recognized credentials, and nontraditional, experimental credentials.

Other key words and phrases that are used throughout this paper also help frame the topic:

Competency: "A learnable, measurable, role-relevant, and behavior-based characteristic or capability of an individual" (Lumina Foundation 2015a, 11). In the Connecting Credentials Framework, competencies "are broken into two learning domains: knowledge and skills. The latter domain is broken into three sub-domains: specialized skills, personal skills and social skills" (Lumina Foundation 2015a, 2. See also Everhart, Bushway, and Schejbal 2016). Note that a focus on the value of competencies is not the same as "competency-based education," that is, the restructuring of academic programs to focus on mastery of competencies rather than focusing on time. References to competencies in this paper are relevant for knowledge and skills in all types of credentials and academic programs.

Connected credentials: Defining "connected credentials" is the purpose of this paper, as well as the focus of many of the initiatives outlined in the section below. In the context of this paper, "connected credentials" refers broadly to multiple aspects of connectedness, including connections and relationships among credentials, connections to purpose and value in multiple contexts, and connections to opportunities for credential earners. Note that "connected credentials" is a

broader phrase than "stackable credentials" with regard to connections among credentials, because it includes lateral, latticed, nested, and other connections as well as sequenced "build" or "stack" connections.

Stackable credential: "A credential that is part of a sequence of credentials that can be accumulated over time to build up an individual's qualifications and help that individual move along a career pathway to further education, different responsibilities, and potentially higher-paying jobs" (Lumina Foundation 2015a, 12. See also Ganzglass 2014).

Career pathways: "The career pathway approach connects progressive levels of education, training, support services, and credentials for specific occupations in a way that optimizes the progress and success of individuals with varying levels of abilities and needs. This approach helps individuals earn marketable credentials, engage in further education and employment, and achieve economic success. Career pathways deeply engage employers and help meet their workforce needs; they also help states and communities strengthen their workforces and economies" (Lumina Foundation 2015a, 10).

Collective Impact for Connecting Credentials

Different types of credentials attest to what people know and are able to do, but they vary in many ways, as seen in the definitions above. They:

- Serve different purposes (e.g., testify to completion of a program of study, verify an individual's qualifications, document achievement of specific competencies)
- Are awarded by different types of authorized entities (e.g., educational institutions, professional and industry certifying bodies, state licensure boards)
- Are awarded based on different frameworks (e.g., higher education program requirements, industry-validated competencies and mastery levels, certification and licensure board definitions)
- Are subject to different quality assurance processes (e.g., higher education accreditation, third-party validation, state reviews)

In the face of these many variations, stakeholders struggle to make sense of how credentials are related to each other. This is a particularly poignant struggle for those who seek to earn credentials, since they have few guides or coordinated information to help them make decisions and appropriate investments.

There is widespread agreement that clarification of the U.S. credentialing ecosystem is necessary and timely, as is evidenced by new and ongoing efforts from federal and state governments, higher education institutions, foundations, and professional organizations. The Connecting Credentials Initiative's

There is widespread agreement that clarification of the U.S. credentialing ecosystem is necessary and timely.

Making the Case paper provides a clear overview of the situation, outlining the contextual factors that put pressure on our credentialing ecosystem (Lumina Foundation 2015b, 1–4):

- The diverse range of students pursuing postsecondary education, including approximately 85 percent post-traditional students (Soares 2013, 6)
- The mismatch between what employers need and job seekers' capabilities
- Lack of clear credential pathways to help students understand and reach their goals
- The proliferation of education and training providers, with most people using multiple providers
- Lack of transparency and consistency in quality assurance for credentials

A number of initiatives are responding to these contextual factors and providing frameworks for how to address them. Those described here by no means comprise a comprehensive list, but they include several that directly support the quality dimensions at the heart of this paper, providing useful starting points for action. In the challenge questions later in this paper, explicit references to these initiatives and frameworks offer concrete ways of improving credentials. The dialogue and action stimulated at higher education institutions by this paper can become part of the larger collective impact of these initiatives.

Connecting Credentials is an initiative organizing national dialogue on transforming our credentialing system to be student-centered and learning-based. It is managed by the Corporation for a Skilled Workforce (CSW) with support from Lumina Foundation. Key components of this work, among many other useful resources, include:

- **The Connecting Credentials website**, which serves as a hub for national dialogue and collects resources, news, and information about related initiatives
- ***Making the Case***, an overview document explaining why credentials should connect and why action is necessary
- ***Connecting Credentials: A Beta Credentials Framework***, which "uses competencies as common reference points to help users understand and compare the levels of knowledge and skills that underlie all credentials—including degrees, certificates, industry certifications, licenses, apprenticeships, and badges." This common

framework and language for describing credentials is intended to make credentials more transparent and easier to compare.

- ***Landscape Review of Innovations in the U.S. Credentialing Marketplace***, providing a listing and descriptions of national and multi-state initiatives addressing the issues outlined in *Making the Case.* See also the **Related Initiatives** page on the Connecting Credentials website.

Connecting Credentials provides a useful introduction to the current context for the connectedness of credentials and the initiatives working in this space. It offers practical tools for action, most notably the Beta Credentials Framework, to analyze and compare what is included in specific credentials.

The Credential Transparency Initiative is working "to create greater coherence and transparency in the U.S. credentialing marketplace . . . and will develop common terms for describing key features of credentials; create a voluntary, web-based registry for sharing the resulting information; and test practical apps (software applications) for employers, students, educators, and other credential stakeholders." It is led by George Washington University's (DC) Institute of Public Policy, Workcred, an affiliate of the American National Standards Institute, and Southern Illinois University, with funding by Lumina Foundation. Key components of this work include:

- **Credential descriptors**, common terms and metadata schema (coding systems) for describing key features and characteristics of credentials in the areas of transparency and portability, trust and quality, and quality assurance. These descriptors include, among many critical characteristics, credential type, competency requirements, labor market and transfer value, education and career pathway connections, authentication, external validation, and quality requirements.
- An open, voluntary **Credential Registry** using the credential descriptors to describe different credentials, enabling comparisons and helping to align credentials with the needs of stakeholders.

The Credential Transparency Initiative provides practical and actionable logical and technical frameworks supporting transparency, coherence, and alignment among credentialing systems. The credential descriptors can be used to articulate the characteristics of specific credentials, regardless of whether or not they will be included in the Credential Registry.

IMS Global Learning Consortium Digital Credentialing initiatives are developing conceptual frameworks and technical standards for the implementation of competency-based education systems, extended transcripts,

and digital credentials. These initiatives bring together higher education institutions, technology providers, and related organizations (such as the **Competency-Based Education Network** (C-BEN), the **American Association of Collegiate Registrars and Admissions Officers** (AACRAO), and the **Badge Alliance**). They are collaborating on methods and standards for the interoperability of competencies and student performance records across academic technology systems such as student information systems, learning management systems, and financial aid systems. These emerging standards support web-enabled infrastructure for competency records, open badges as portable evidence of learning, detailed documentation of competencies as part of transcripts, technical connections among credentials, and other credentialing innovations.

The **Degree Qualifications Profile** (DQP), the Association of American Colleges and Universities' **Liberal Education and America's Promise** (LEAP) initiative, and the **Global Learning Qualifications Framework** (GLQF) all provide frameworks for defining learning outcomes and learning domains that are represented in credentials. The DQP "outlines a set of reference points for what students should know and be able to do upon completion of associate, bachelor's, and master's degrees—in any field of study" (Lumina Foundation 2016). LEAP challenges the arbitrary dichotomy between a liberal education and a practical education, defining learning outcomes that are essential for all students and "for a nation dependent on economic creativity and democratic vitality" (Association of American Colleges and Universities 2016). The GLQF defines overarching constructs and learning domains for a structured approach "designed to assist students to document their verifiable college/university-level learning for academic credit and to provide an academic framework for evaluators to evaluate student learning" (State University of New York Empire State College 2016). All of these frameworks have related tools, resources, and communities of practice for applying their principles to analysis and improvement of educational programs and credentials.

The American Council on Education's College Credit Recommendation Service (CREDIT®) provides evaluations of course equivalency that "connect workplace learning with colleges and universities by helping students gain access to academic credit for formal training taken outside traditional degree programs." This service connects different types of credentials by translating learning outcomes from corporate training, military programs, government-issued examinations, professional certifications, and other sources into academic credits. One of its key resources is the **National Guide**

to College Credit for Workforce Training, a registry of providers, courses, exams, certificates, and other representations of learning mapped to their recommended academic credit equivalents. Another approach to this service is available through the **Alternative Credit Project**, supported by the Bill & Melinda Gates Foundation, connecting non-accredited education providers with academic institutions accepting their courses for credit in degree programs. This project aims to create more flexible pathways to credential attainment by identifying and evaluating learning opportunities from nontraditional providers so that they can become part of credentialing ecosystems.

The Evolution and Potential of Career Pathways report is one of numerous U.S. government resources developed by the Department of Education and the Department of Labor to support more effective connections between credentials and career opportunities. This report provides a framework for the development of training and education programs for building a skilled workforce. It provides practical guidance on what works in career pathway systems that engage employers, build cross-agency partnerships, design educational programs, align with applicable policies, and measure system performance to "help adults acquire marketable skills and industry recognized credentials" (U.S. Department of Education, Office of Career, Technical, and Adult Education 2015, 6. See also "Shared Vision, Strong Systems: The Alliance for Quality Career Pathways Framework," (Center for Law and Social Policy 2014).

Key Stakeholders

Photo courtesy of ACE member institution Ohio University.

In order to better connect different types of credentials so that they are more useful to stakeholders, it is necessary to understand the perspectives of those involved in credentialing ecosystems. What are they trying to accomplish with credentials? What problems do they currently encounter, and how can those problems be addressed?

For the purposes of these descriptions, the complexity of participants in credentialing ecosystems has been simplified to focus on four types of stakeholders:

- Credential earners
- Credential issuers
- Credential consumers
- Credential endorsers

These stakeholders have very different perspectives on credentials, and these differences often lead to miscommunications and lack of understanding about how stakeholders need to work together to improve credentials for all parties. Below are descriptions of these stakeholders and their perspectives on some of the challenges with the current state of credentials.

To better connect different types of credentials so that they are more useful to stakeholders, it is necessary to understand the perspectives of those involved in credentialing ecosystems.

CREDENTIAL EARNERS

Earners are the people who attain credentials. Typically they are students at educational institutions, people completing credentials offered by nontraditional learning providers, such as bootcamps or massive open online course (MOOC) providers, or those awarded certifications from professional and

industry organizations or licenses from states.

Credential earners have many different reasons for seeking credentials, but most want credentials as evidence that they are educated and possess certain skills so that they can secure further educational opportunities and/or employment and career advancement. They need to understand their credentialing options and the social and professional values associated with different credentials. Connected credentials help them define and follow career pathways to achieve their goals.

Those seeking to earn credentials face numerous problems when credentials are not transparent, modular, portable, relevant, valid, and equitable. Some typical problems include:

- Earners do not always have ways to compare credentials with regard to what they include, their market value, their cost (including tuition and other costs of attendance), their transferability, their validity, and other critical factors.
- Earners do not always have clear and efficient ways of signaling their competencies to employers and other credential consumers.
- Credentials might be out of date and not connected to current workforce needs.
- Most credentials either do not include modular components with independent value or do not provide ways to make these components useful in contexts outside the institution.
- How credentials can stack or otherwise combine with other credentials in career pathways is not clear.
- Earners encounter many structural dead ends in their pursuit of credentials, including lack of portability, transferability, or articulation of some credentials, difficulty in moving from noncredit to credit-bearing programs, and difficulty accessing financial aid for nontraditional learning options.
- Not all educational institutions provide on-ramps and practical supports that enable educational access for individuals with varying abilities or preparation, and/or unfinished credentials. Low-skill, low-income, first-generation, and other disadvantaged individuals may have difficulty finding programs of study that meet their needs and lead to valuable postsecondary credentials.
- The choices individuals make about investing time and resources in credentials, including taking on debt, may have a significant impact on their ability to earn wages, pay back loans, and ultimately have more control over their socioeconomic mobility; inappropriate

Most credential earners want credentials as evidence that they are educated and possess certain skills so that they can secure further educational opportunities and/or employment and career advancement.

choices can have severe long-term consequences.

- Prior learning (knowledge and skills, including from military and work experience) is often not translatable into progress toward credential achievement or not recognized at all.

CREDENTIAL ISSUERS

Issuers are organizations that award credentials to earners. These have traditionally been educational institutions, such as colleges and universities, including proprietary institutions, as well as regulatory groups and licensure boards awarding certifications and licenses. Issuers also include an ever-expanding diversity of training and nontraditional-learning providers with variable types of authorization and claims for the value of their credentials.

Despite their diversity, credential issuers share the common function of evaluating earners' competencies and awarding credentials that represent achievement of those competencies. In some cases, the competencies are clearly and transparently communicated to stakeholders, while in others the competencies are embedded in courses, credit hours, and other traditional but less transparent units. Credential issuers seek to maintain and improve their reputations, attract new credential earners, meet the requirements of authorizing bodies, and adapt to meet the changing needs of stakeholders. Connected credentials help them address these needs by more clearly defining and enabling comparisons of the value, quality, and effectiveness of their credentials.

Issuers share the common function of evaluating earners' competencies and awarding credentials that represent achievement of those competencies.

Issuers face numerous problems when credentials are not transparent, modular, portable, relevant, valid, and equitable. Some typical problems include:

- A lack of frameworks for clear communication about what credentials include, their market value, their transferability, their validity, and other critical factors can make it challenging for issuers to articulate and promote the value and quality of their credentials as compared to others'.
- Issuers lack reliable information about the relationships between their credentials and those of others, including issuers that could be collaborators or competitors.
- How issuers could independently or collaboratively stack or otherwise connect credentials to create beneficial career pathways is not always clear.
- The relevance and/or portability of an issuer's credentials could be geographically or otherwise market constrained without broader frameworks for defining relevance.

- Lack of transparency in quality assurance processes makes it harder for issuers to compare their practices with others, dispute accusations of low quality, or promote attributions of high quality.
- Communication and collaboration between issuers and industry/employers are hindered by a lack of common descriptors and other frameworks to facilitate shared understanding of what is included in credentials.

CREDENTIAL CONSUMERS

Consumers are those who use credentials to make judgments and decisions about the qualifications and competencies of earners for specific purposes, particularly further education, employment, suitability for specific professional occupations, and career advancement. Therefore, credential consumers are commonly educational institutions (using credentials in application processes and/or applying prior credentials to progress toward additional credentials) and employers (using credentials in employee application and promotion processes). In the case of certifications and licenses, these types of credentials support the processes above and also serve the general public in making decisions about the qualifications of practitioners in specific fields.

Consumers are those who use credentials to make judgments and decisions about the qualifications and competencies of earners.

Credential consumers face numerous problems when credentials are not transparent, modular, portable, relevant, valid, and equitable. Some typical problems include:

- Employers have difficulty understanding the competencies potential employees may or may not have mastered in a credential and the quality of learning the credential represents. They also have difficulty comparing applicants who hold different credentials. This is caused in part by the fact that issuers do not use common frameworks for the definition of credentials, even credentials of the same type, and the quality of education and training therefore varies tremendously.
- Employers' recruiters make blanket judgments about certain types of credentials and whether or not they are relevant for the jobs they are filling. This is in part caused by a lack of communication about what is included in a credential and how it could map to certain types of jobs.
- Employers bear the burden and expense of teaching new employees the skills they need because students often do not have an opportunity to apply and practice relevant, specific skills as part of a credential.
- Because of a lack of transparency, employers do not know how to

define the relationship between competencies included in academic credentials and competencies included in workplace training/learning, making portability very difficult and the applicability of credentials uncertain. Large employers will often invest in their own internal training departments to ensure that their employees are trained to their specifications, rather than accepting existing credentials.

- Requirements from employers and industry groups are gathered and incorporated into credentials only periodically, if at all, reducing the ongoing relevance and currency of credentials.
- Employers make decisions about the integrity of credentials based on biases such as the reputation of the issuer or the longevity of the credential, rather than using more objective information, such as the competencies included in the credential or the employment performance of individuals who have earned the credential.
- Educational institutions often do not know how to apply credit in specific, useful ways for a credential they did not issue. They have difficulty applying the educational work represented by a credential to a student's subsequent educational progress, sometimes even at the same institution.
- Many educational institutions do not have systematic processes for evaluating outside credentials and awarding credit for them, nor is it perceived as part of their mission at many institutions. As demand from credential earners increases, more educational institutions feel pressure to develop strategies for applying credits for prior credentials.
- Without clear definitions and common descriptors for the competencies included in credentials, often a credential becomes more opaque when it is transferred as progress toward another credential—for example, credits that transfer to "general education."

CREDENTIAL ENDORSERS

Endorsers traditionally have been accrediting bodies or other independent third parties that vouch for the institution or organization and the quality and validity of its credentials. Endorsers are often also the ones who authorize issuers to award specific credentials. In the case of certifications and licenses, these authorizing entities can be licensure boards, state agencies, or industry organizations.

By default, consumers are also implied, sometimes explicit, endorsers because of their acceptance of specific credentials from specific issuers. Examples include employers who regularly hire job candidates who hold specific

credentials or educational institutions which regularly accept applicants with specific credentials. Sometimes a consumer's recognition of credentials is publicized or even formalized, such as in articulation agreements and education-to-employment partnerships.

As credentials proliferate, the need for third-party endorsements increases. There is a risk, however, that increasing numbers and types of endorsements will complicate credentials even more. It is important that structures and criteria for endorsements are transparent. Frameworks are evolving that would allow any third party to endorse a credential (in general or from a specific issuer) and provide explanation of the criteria backing the endorsement. This could evolve into systems for endorsing endorsers, building trust networks. The adoption of common, well-understood, and easily referenced and searchable endorsements will greatly expand their applicability in credentialing ecosystems.

Endorsers face numerous problems when credentials are not transparent, modular, portable, relevant, valid, and equitable. These problems can lead to a lack of endorsements. Some typical problems include:

As credentials proliferate, the need for third-party endorsements increases.

- In many cases the problems encountered by endorsers reflect the problems encountered by consumers trying to determine the value of credentials.
- Endorsers lack reliable information on which to base their endorsements. They often do not have ways to compare credentials with regard to what they include, their market value, their transferability, their validity, and other critical factors.
- Lack of transparency in quality assurance processes makes it hard for endorsers to compare their endorsements to others' or otherwise understand endorsements in a broader context.
- Earners and consumers may not understand the basis and criteria for an endorsement.
- The lack of clear frameworks and common descriptors leads to endorsements that are opaque, in many cases based on reputation or assumptions rather than well-defined criteria.

Dimensions of Quality for Connected Credentials

Photo courtesy of ACE member institution Adelphi University (NY).

The six dimensions described in this paper—transparency, modularity, portability, relevance, validity, and equity—have been distilled from many different ways of considering and analyzing what characterizes quality in connected credentials. They are not all-encompassing, but they provide useful ways of discussing credentials and how they can be improved, both generally and in the analysis of specific credentials.

The dimensions overlap and also mutually reinforce each other. For example, modularity supports portability by making it easier to move credentials from one context to another; transparency supports relevance, by making it easier for consumers to understand what a credential includes and therefore how it is relevant for their purposes. The characteristics described below promote better understanding of credentials, leading to new and more effective connections, including:

- Connections and relationships among credentials
- Connections to purpose and value for multiple stakeholders in multiple contexts
- Connections to opportunities for credential earners

Each of the dimensions also illuminates specific aspects of connectedness, as described below.

TRANSPARENCY

- The competencies (knowledge and specialized skills, personal skills, and social skills) represented by the credential are clearly defined.

- How the credential leads to careers and/or further education is clearly defined.
- Information on multiple aspects of the credential—including the competencies it represents, its relationship to other credentials, its transfer value, its value in labor markets, and the cost of attaining it—is clearly provided to earners, issuers, endorsers, and consumers of credentials to enable them to determine value based on their needs and priorities.
- The information provided about the credential is clear, enables comparison of credentials, persists, and, whenever possible, is based on shared standards, common language/descriptors, and/or frameworks.
- The quality assurance processes supporting the credential are clearly communicated to all stakeholders.
- The requirements for renewal of the credential, where appropriate, are clearly defined to ensure a credential earner remains competent in the body of knowledge represented by the credential.

Transparency supports connectedness by making credentials easier to understand and compare, facilitating the definition and implementation of relationships among credentials. Transparency also supports connections to opportunities by helping all stakeholders understand how credentials are valuable.

MODULARITY

- The credential includes units that carry independent value. These units might also be credentials.
- The units within the credential can be combined in multiple ways with other units and credentials to create career pathways.
- The credential is stackable—that is, one credential can be built on another to demonstrate attainment of broader, more complex, and/or more specialized knowledge and skills over time.
- The credential includes measurable milestones to help students understand their own success along learning pathways to careers and further growth.

Modularity supports connectedness by making credentials more componentized and less monolithic, leading to more connection points and possible relationships among credentials. Modularity also helps students understand the components within credentials and how they connect to each other and to larger goals such as socioeconomic mobility and lifelong learning.

PORTABILITY

- The credential has value locally, nationally, and perhaps internationally in labor markets, educational systems, and/or other contexts.
- The earner is able to use the credential in a variety of environments, and the content and competencies the credential represents remain intact and are accessible by credential consumers.
- The credential enables earners to move vertically and horizontally within and across the credentialing ecosystem for attainment of other credentials.

Portability supports connectedness by making credentials more applicable in multiple contexts, connecting to multiple purposes and opportunities. Portability also facilitates connections among different types of credentials in different environments.

RELEVANCE

- The credential prepares the earner for further education/training or additional credentials as part of a lifelong learning continuum.
- The credential prepares the earner for career, employment, civic, and/or social engagement and meaningful contributions in communities of practice.
- The credential carries meaning and has value to specific stakeholders within their own contexts. These contexts may include labor markets, educational systems, civic organizations, and/or social groups, locally, regionally, nationally, or internationally.
- The credential has relevant symbolic value that gives it currency among specific stakeholders, i.e., value based on recognition and interpersonal interpretations. This symbolic value could come from the reputation of the issuer and/or endorsers, the recognition of the credential in specific fields, and/or social perceptions, broadly and/or in communities of practice.
- The credential has relevant documented value that gives it currency among specific stakeholders, i.e., value associated with concrete evidence. This documented value could be credential-related employment rates, transfer/articulation agreements, clearly identified alignment with competencies that are in demand by employers, and/or defined successes of graduates in their communities of practice.
- The credential can be regularly updated to ensure the knowledge and skills it represents are current. The frequency of updates is appropriate to the content and field the credential represents.
- What the credential claims to represent can be verified by one or more authorities.

Relevance supports connectedness by illuminating the applicability and purposes of credentials for specific stakeholders in their own contexts, thereby connecting to opportunities in those contexts. Relevance also connects and amplifies different types of value by helping stakeholders understand the network of verification, documentation, evidence, and social interpretation supporting the credential.

VALIDITY

- Validity concerns both everyday characterizations of "valued" such as industry-recognized or accredited, as well as how it is used by measurement specialists as it relates to evidence. Value and evidence include specific claims associated with particular assessments as well as general claims associated with entire credentials.
- Face validity (i.e., credibility): Stakeholders believe the claims that are being made, independent of the evidence supporting those claims. Face validity is demonstrated by evidence that the assessments and/or credentials are perceived to capture what they claim to capture. Evidence of face validity is typically gathered via surveys.
- Content Validity: There is evidence that the assessments and/or credential represent the right things in the right balance, that nothing important was left out, and that students were not unduly coached as to the specific items on an assessment or the specific features of a learning artifact. Evidence of content validity is typically gathered via content analysis of assessments or competency maps in light of claims made regarding the score or the credential.
- Predictive Validity: There is evidence that the claims made by the credential have been borne out in reality. This means that there is evidence that the assessments for attaining the credential accurately predict an individual's ability to do something in the future, on the job, or in a community of practice. Evidence of predictive validity is typically gathered by studying whether individuals who earn a passing score on an assessment or who earn the credential actually know or can actually accomplish what was claimed.
- Concurrent Validity: There is parallel evidence supporting the claims made in the credential. Evidence of concurrent validity is typically gathered by looking at other sources of evidence that the individual knows something documented in an assessment and/or can carry out the job claimed by the credential.

Validity supports connectedness by illuminating the broad frameworks of meaning and value that connect the credential to opportunities. Validity provides a shared understanding and trust of how the credential is defined,

including the evidence and quality assurance structures that are necessary to implement well-defined relationships among credentials.

EQUITY

- The credential is an enabling mechanism for promoting educational, social, and/or economic mobility.
- There are on-ramps and practical supports to enable educational access for students with varying abilities, preparation, and/or prior credentials or unfinished credentials. Low-skill, low-income, first-generation, and other disadvantaged individuals can find and pursue credentialing options that meet their needs.
- The credential is stackable and/or related to other credentials that can be accumulated flexibly, including stopping and starting education over time, to help an individual build qualifications and move along a pathway to further education and/or better employment opportunities, increased wages, and career advancement.
- The modular units of the credential in and of themselves provide value to help people advance in careers, education, and other contexts.
- The credential's transparency and measurable milestones help learners understand and document their own knowledge, skills, and abilities to increase their competitive advantage, qualify for new and evolving jobs in labor markets, and advance in their careers over time.

Equity as a dimension of quality credentials helps people overcome their disadvantages and connect to opportunities. Equity provides a network of flexible access points and supports that connect students to credential attainment and the benefits of lifelong learning.

Describing the Current State of Credential Types

Photo courtesy of ACE member institution Stephen F. Austin State University (TX).

An understanding of the current state of credentials is required in order to make improvements in the quality connectedness of credentials. Below are general descriptions of types of credentials with regard to how they address the six quality dimensions from the prior section. The huge variety among credentials means that these general descriptions cannot capture their diversity; nonetheless, this section aims to help us visualize how credentials typically address (or do not address) certain dimensions of quality.

These descriptions serve to stimulate discussion and debate. Specific credential offerings at an institution could be different from these descriptions, and both the differences and similarities can help with analysis. The challenge questions in the following section provide a framework for dialogue and analysis of specific credentials at your own institution.

ACADEMIC DEGREES

Although there are many variations among degrees, bachelor's and associate degrees share typical strengths and weaknesses with regard to the quality dimensions. Below are descriptions of degrees in general with some distinctions between bachelor's and associate degrees.

TRANSPARENCY

- The relationships between types of degrees generally represent clear levels of progression.
- Degrees could be more transparent with explicit definition of the competencies they represent, so that stakeholders can see the value of these competencies.

- Students could benefit from more transparent information on labor market value and other outcomes of specific degree programs.

Bachelor's Degrees

- A bachelor's degree is widely understood to be valuable in terms of economic and social outcomes.
- A bachelor's degree is clearly understood to be a prerequisite to graduate degrees.

Associate Degrees

- The relationship of some associate degrees to other credentials is clearly defined, most often from associate to bachelor's programs.
- Stakeholders could benefit from more transparent information about the differences between associate degrees, associate of applied science degrees, and certificates with similar sounding names.

MODULARITY

- A degree is generally thought about as a single entity—in many cases the discrete units or competencies included in a degree are not apparent.
- Degrees often do not contain units or other credentials that can carry independent value outside the institution, other than course credits.

Bachelor's Degrees

- A bachelor's can be stacked to lead to graduate degrees and other advanced studies.

Associate Degrees

- An associate degree can generally be stacked to lead to a bachelor's. However, an associate of applied science is considered a terminal degree, and usually only some credits can transfer to a bachelor's.
- The structure of degree programs usually starts with general education and then moves to specialization, which makes it difficult to connect certifications and associate of applied science degrees, which are more specifically focused, into the programs of study leading to a bachelor's.
- Some associate degrees, particularly associate of applied science degrees, are being modularized into shorter certificate programs as part of career pathways.

PORTABILITY

- Most degrees, particularly bachelor's, have value locally, nationally, and internationally.

Bachelor's Degrees

- A bachelor's is widely recognized as a requirement for employment for many types of jobs. In fact, employers are increasingly requiring a bachelor's even for jobs that did not previously require them (Burning Glass Technologies 2014).
- A bachelor's is widely recognized as a prerequisite to graduate education.

Associate Degrees

- Many associate degrees are transferrable to bachelor's-level programs of study.
- Customization of competencies to local labor market requirements for associate degrees and especially associate of applied science degrees may make them more valuable locally but impede the portability of those degrees.

RELEVANCE

- Degrees are generally relevant in preparing earners for lifelong learning, employment, and contributions to communities of practice.
- Educational institutions or employers seeking applicants with specific competencies could benefit from more transparent information to help them understand degrees' specific value and relevance for their needs.
- Degrees are verified by the accredited educational institutions that issued them.
- Stakeholders could benefit from verification of the specific competencies included in a degree.
- Accreditors evaluate degree programs for their currency and relevance to stakeholders, including employers.

Bachelor's Degrees

- A bachelor's degree is widely assumed to have symbolic value and improve the status of the holder with regard to career and social standing.
- Research documents that a bachelor's degree is valuable with regard to employment, earnings, and other desired outcomes (Carnevale, Smith, and Strohl 2013).

Associate Degrees

- The relevance of associate degrees in labor markets varies depending on the specific program.

- The relevance of associate degrees to the requirements for transfer to bachelor's-level programs varies.
- The applied nature of associate of applied science degrees addresses employers' needs with the specifically relevant knowledge and skills these degrees represent.

VALIDITY

- Degrees are awarded by educational institutions whose practices and programs have been validated by third party accreditors.
- Predictive validity can be demonstrated at the degree level for specific degree programs in relation to specific jobs, based on research with regard to job placement and success of graduates.
- Most degrees have face validity locally, nationally, and internationally.
- Institutional brand can enhance the face validity of degrees.
- Degrees that are supported by both institutional accreditors and specific programmatic accreditors are generally considered valid with regard to required professional competencies.

EQUITY

- Earners of degrees generally do better in terms of employment, earnings, and other outcomes than those without degrees.
- If a student stops out prior to being awarded a degree, they generally do not have any credential or modular units with independent value that they can use outside the institution.
- If a student stops their education and then restarts, they often have difficulty getting credit toward their new program of study for what they previously completed.
- Improved transparency in degrees would help students understand the value of what they are learning and how it contributes to their career pathways.

Bachelor's Degrees

- Earners of degrees generally benefit from the credibility and the symbolic and documented value of the degree, particularly the bachelor's degree, with its inherent opportunities for social and economic mobility.

Associate Degrees

- Associate degrees can be valuable credentials for upward mobility, but the outcomes vary depending on the program of study.

- Associate degrees in specific fields of study that are supported by program accreditation have targeted value in labor markets.
- Loss of credits, which often happens in transfers from associate programs to other programs, is a predictor of degree non-completion, especially among low-income, first-generation, and part-time students.

CERTIFICATES

TRANSPARENCY

- Some certificates are transparent in their structure and requirements, but in general, stakeholders are confused by certificates because they are awarded for completion of a wide variety of programs with different lengths ranging from just one day to one year or more. Often the names of certificates are similar, even though they may represent different kinds and amounts of learning.
- Most certificates from academic programs are assumed to represent knowledge and skills below the associate level, but many certificates are awarded at the bachelor's and master's levels.

MODULARITY

- Some certificate programs of study include opportunities to earn one or more industry certifications that have independent value in labor markets.
- Some certificates are modules of associate or other degrees.

PORTABILITY

- Some credit-bearing certificates are transferrable to degrees, but many are not.
- Some certificates are not credit-bearing and therefore generally not transferable to degrees.

RELEVANCE

- The relevance of certificates to labor market demand is highly variable.
- Stakeholders have difficulty understanding the relevance of certificates because of their wide variety.

VALIDITY

- Certificates generally have less face validity than degrees, although employers who know the program may consider a specific certificate valid and the outcomes of the program relevant to their needs.

EQUITY

- Certificates can help individuals access good jobs and advance to better jobs when certificates are defined to meet employers' needs and employers understand their relevance.
- Certificates can be stepping stones to further postsecondary education.

CERTIFICATIONS

Certifications are awarded by private companies, nonprofit organizations, or government agencies to validate the certification holder's competence for practice in a given profession or trade. Certification awarding bodies may relegate authority to highly skilled instructors/trainers to recognize competence in a given skill, profession, or trade. Many certifications require a renewal process, which is defined in the policies and procedures of the certifying body.

TRANSPARENCY

- The criteria for certification are known because they are determined by a profession, industry, or trade as the entry-level requirements to claim the certification title or designation. However, there are different and sometimes competing certifications with different criteria, and which ones are accepted by employers is not always clear.
- Some certifying bodies will provide a list of certification holders.
- The standards and quality assurance mechanisms supporting certifications are often not transparent even within the relevant industry.

MODULARITY

- Certifying bodies typically require that certification earners meet the predetermined criteria via three components: educational training, supervised practice or skill demonstration, and testing. Each may be considered a separate module.
- Continuing education and training can be stacked for more advanced or specialized levels of certification.
- Certifications are sometimes modules in occupational certificates and degrees.

PORTABILITY

- Certifications are often recognized at the national and international levels. However, some certifications are accepted only regionally or by some employers but not others, limiting portability.
- Reciprocity among certifying bodies is generally established by agreements of the boards of directors of the bodies.

- Certifications are generally not transferable to academic credentials other than through credit for prior learning processes.
- Certifications are often required or recognized in licensing processes.

RELEVANCE

- Certifications are relevant and required for individuals to advertise themselves as certified professionals or tradespersons. The specific industry oversees and validates the certification.
- Certifying bodies may be connected to governmental agencies or professional or trade associations.
- Certification protects the profession or trade/industry from litigation by verifying a person's competence in a given skill/practice. Unlike state licensure laws, which are passed in order to protect the public from harm, certifications protect professional titles.

VALIDITY

- Certifications require the demonstration of a predetermined set of knowledge, skills, and abilities defined by a profession, industry, or agency.

EQUITY

- Possession of a certification is often required to engage in certain professions, trades, or designated activities. An individual may possess certain competencies through experience but cannot claim certification without going through the certification process.
- Certifying organizations strive to have their certification as the gold standard for that profession or trade. Therefore their work helps holders of current certifications be more marketable for open positions.
- Certified professions and trades that are successful in integrating the credential into a given industry or service are able to secure better pay for their certification holders.
- The transparency of certification requirements and the relationship between a certification and specific professional opportunities enable clear decision making with regard to the pathways leading to the certification.

LICENSES

State licensure laws are passed in order to protect the public from harm. Each state designates via legislation those professions and trades that require

a license to practice. State license laws define the scope of practice of a profession or trade, who is eligible, and where there are exclusions. License holders must apply for license renewal according to specified legal requirements.

TRANSPARENCY

- State licensure laws clearly delineate the required criteria (education, testing, and experience) for a given license.
- State licensure boards sometimes make available listings of state licensed practitioners.

MODULARITY

- State licensure practice typically requires three components: educational training, some form of supervised practice (e.g., internship, fieldwork, practical), and testing. Each may be considered a separate module of education and training.
- License renewals typically require a form of approved continuing education related to the practice of the profession or trade. The continuing education components can be offered as full academic courses, modular training for improved practice or for specific specialization, or other forms of professional continuing development.
- Licenses are sometimes modules in academic credentials.

PORTABILITY

- The content and meaning of the license are consistent anywhere within the jurisdiction of the licensure.
- Since state licensure laws delineate criteria for licenses, the licensure boards may allow for licensure reciprocity between states. However, lack of reciprocity and different license requirements in different states limit portability and opportunities for license earners.
- Licenses are generally not transferable to academic credentials other than through credit for prior learning processes.

RELEVANCE

- Licensure criteria are determined by best practices of the given profession.
- In applying for a license in a given profession or trade, applicants must provide proof of education, experience, and/or testing results as specified by individual state law.
- Licensed providers of a service are required to maintain currency of knowledge, skills, and abilities for practice in the interest of pro-

tecting the public from poorly prepared or outdated practitioners. Therefore, licensing laws define processes, including continuing education and practice criteria, for maintaining current practice competencies and for renewal of an individual's license.

VALIDITY

- Designated state licensure boards review all applications for licensure and make determinations as to whether the individual meets the defined criteria.
- The competencies of the practitioner are verified via the submission of an application and official documents supporting the education, experience, and knowledge of the applicant.

EQUITY

- For licensed professions and trades, the holder of a current license is more marketable for open positions.
- Licensed professions and trades tend to garner better pay than non-licensed professions.
- The transparency of licensing requirements and the relationship between a license and specific professional opportunities enable clear decision making with regard to the pathways leading to the license.

BADGES

TRANSPARENCY

- Badges are transparent by design: Their associated metadata/internal descriptors that are built into the badge have been structured to reveal aspects of the learning experience that led to the earning and receipt of the badge, and this information is easily readable and accessible. Supporting evidence can be included (linked to) in a badge's metadata to show what an earner knows and can do.
- A badge's criteria can be used to link it with other badges/credentials across a variety of institutions/organizations to develop learning pathways in dynamic, new ways that were previously not possible. However, the criteria in a badge can be as open and transparent or as limited and closed as the issuer decides. Consequently, not all badges are created with equal transparency; for example, the criteria might not describe the assessment process or the environment in which the learning took place.
- While badges are technically transparent, no common language for descriptions or clear framework for criteria creation currently exist.

MODULARITY

- Badges are modular in that they can be "sized" according to the needs of issuers, earners, and consumers.
- Technical interoperability is baked into badges, and the technical standard is designed to be adaptable for different types, sizes, and purposes for badges.
- The interoperable structure of badges ensures that they have the potential for stackability.
- Many badges are being designed to reflect learning or experiences at a more granular level, for example as representations of specific competencies, which allows them to operate in more modular ways.

PORTABILITY

- Technology introduced in the Open Badges Standard 1.1 has been designed to ensure that badges can be easily ported from one organization or institution to another, thereby removing technological hurdles with regard to portability (Badge Alliance 2016). Further developments with linked data will extend this portability and the interoperability of badges in different environments.
- While open badges are designed to surface the criteria that an earner must achieve, not all *digital* badges are *open* badges, and this complicates portability and consumption and creates confusion among stakeholders.

RELEVANCE

- Badges carry meaning and relevance in context-specific ways since they are created and defined independently by their issuers. However, ecosystems for the development and exchange value of badges among stakeholders are still very much in their infancy.
- The design of badges guarantees issuer verification, since the badge is technically tied to the issuer.
- Given their metadata structure, badges can be designed to be hyper-relevant with regard to criteria for earning the badge, standards for learning outcomes, competency frameworks, etc.
- Badges can be designed to expire as the earner's set of competencies or experience ages.
- For employers seeking employees with specific skills, badges have the potential to represent these skills in highly relevant ways. However, currently the direct connections between badges and employment are highly variable.

- The relationships among badges and other credentials are still under development, so relevance is a developing issue.

VALIDITY

- Badges are self-validating: The issuing organization and the content of the badge can be verified at any time. However, the validity of the issuing organization and the appropriateness of the badge need to be determined on a case-by-case basis by stakeholders.
- Badges have defined conceptual and technological frameworks for endorsements that can be interoperable and searchable across different environments.
- From an assessment perspective, badge validity is still very much in the developmental stages.
- Most badges have yet to acquire symbolic or documented value, and the same is true of face or predictive validity.

EQUITY

- Currently badges can be earned in a variety of locales and environments by people with widely varying abilities and resources; however, the value of badges for stakeholders is still being determined.
- Badges can help to indicate learning pathways and future opportunities, and since they are owned by their earners, they can also serve to inform the learner of their past learning pathways and potential future directions.

Challenge Questions for Analyzing Credentials and Visualizing Potential Futures

The diversity of credential earners and the needs of credential consumers are evolving rapidly. This poses challenges to academic institutions preparing the next generation of workers, innovators, and leaders. It is one thing to discuss quality dimensions for connected credentials, but quite another thing to figure out how to improve the relevance and currency value of specific credentials to address changing needs. The questions below are intended to stimulate productive dialogue among stakeholders, challenging us to think beyond our own perspectives and assumptions. These are not easy questions to discuss, let alone address, and a single question could provoke months of debate or years of work. But these questions aim to provide a treasure trove of ideas for getting started, for visualizing potential futures and progressing toward connected credentials that add value and meet the needs of stakeholders.

Not all of these questions will be relevant for all credentials or match your institution's specific needs and goals. Also, these descriptions are weighted toward higher education academic perspectives, since that is the primary audience for this paper. Mix, match, and revise to suit the unique processes and goals at your own institution.

TRANSPARENCY

- Are the competencies (knowledge and specialized skills, personal skills, and social skills) represented by this credential clearly defined?
- If this credential is a degree, does it use the Degree Qualifications Profile and/or LEAP to define specific learning outcomes and how they are mapped to the courses that make up the curriculum for the credential?
- Is information about the credential published on the web for all stakeholders to see? Is the information machine-readable, persistent, and versioned over time? Is this information encoded into digital representations of the credential itself? Can it be verified?
- Does this credential use the Connecting Credentials Framework to profile the levels and types of competencies it represents?
- What is the relationship of this credential to other credentials?

The diversity of credential earners and the needs of credential consumers are evolving rapidly. This poses challenges to academic institutions preparing the next generation of workers, innovators, and leaders.

Can information from the Connecting Credentials Framework profile be used to explicitly describe the relationship between this credential and other credentials?

- How do you provide transparency about the quality assurance processes supporting this credential?
- Is there evidence for the labor market value of this credential, and is it communicated to stakeholders?
- Does this credential use clearly defined descriptors from the Credential Transparency Initiative for competencies, transfer value, assessment rigor, third-party approval status, etc.?
- Do you map the competencies in this credential to specific job requirements? Do communication and collaboration with employers illuminate pathways from this credential to employment and career advancement?
- Are the career paths of graduates who have earned this credential accurately reported to stakeholders? Are general information and data supplemented with testimonials from the graduates themselves and social networks for prospective students to connect with graduates?
- Are the further education paths of graduates who have earned this credential accurately reported to stakeholders?
- Are access and articulation paths into this credential as well as from this credential to other credentials clearly identified and explained to prospective and current students?
- Does this credential provide an extended transcript that shows not only the student's courses (names and numbers) and grades, but also links to course descriptions, online syllabi, competencies, and the student's own individual evidence of learning? Is the extended transcript machine-readable, facilitating searching and filtering via systems as well as by using manual click-throughs?

MODULARITY

- Does this credential include modular units that carry independent value?
- At your own institution or across institutions, can the modular units within this credential be applied to other credentials?
- Is the credential stackable? What specifically are its relationships with other credentials that make it stackable?
- How do students see and understand the milestones within this credential with regard to their success along learning pathways to careers and further growth?

- Does this credential provide credit for prior learning? Is the student provided with guidance for using the Global Learning Qualifications Framework to define their own modular learning achievements?
- Does this credential include badges for specific competencies that students master while earning the credential? Do the badges represent specific components and evidence of learning that can be used outside the institution at any time?
- When a student has completed requirements on the way to earning a more comprehensive credential, is he or she conferred a component credential (e.g., an associate of arts degree earned on the way to a bachelor of arts degree)? Is reverse transfer an option? Are students made aware of this and other options and provided with clear guidance if they want to stop out with one credential and continue later to another credential or transfer to another institution or program?
- If students stop out at any point through this credential, can they still use their badges or modular credentials to demonstrate their achievements?
- If this credential is a degree and a student stops out part way through, do the modular competencies from common frameworks (e.g., the Degree Qualifications Profile and LEAP) and the badges that represent them provide broadly understood contextualization that facilitates transfer of course credits to other institutions and programs?

PORTABILITY

- Where and how can earners use this credential?
- What are the relationships with other credentials that enable earners to move vertically and horizontally within and across the credentialing ecosystem for attainment of other credentials?
- Can this credential include credit for prior learning, with well-defined assessments and clear mapping to the competencies that are defined as part of the curriculum?
- Does this credential have clearly defined practices for accepting a broad range of CREDIT recommendations that represent students' military training, employment training, professional examinations, education from nontraditional providers, and other learning from outside the institution?
- Can this credential include transfer credits from other education providers?

- Are there articulation paths into this credential as well as from this credential to other credentials, clearly identified and explained to prospective and current students?
- Do modular competencies and the badges that represent them provide information that makes it easier for employers to understand the value of this credential, including in multiple regions, states, and countries?

RELEVANCE

- What value does this credential carry for specific stakeholders that you identify as important? How do you know what these stakeholders value? Are they involved in your credential improvement processes?
- What gives this credential symbolic value? How can this value be improved?
- What documented value does this credential carry? How is it documented, and is this communicated to stakeholders? How can this value be improved?
- How frequently is this credential updated to ensure it is current? Is that frequency appropriate for the content and field this credential represents? Is information from the field and specific industries used for credential updates and improvements?
- What authorized entity verifies the claims of this credential? Can the claims be verified at a level of specificity that is needed by credential consumers, e.g., at the level of specific competencies?
- Is evidence of learning from specific assessments in this credential shared with employers for their feedback on whether this type of learning is relevant in their field or industry?
- Is the relevance of this credential vis-a-vis other credentials understood through its clearly defined profile using the Connecting Credentials Framework?
- Does this credential include opportunities for internships and workplace-embedded learning, creating bridges and collaboration between educators and employers?
- Does this credential incorporate real world application and practice of specific, job-relevant skills to positively impact students' employment readiness?
- Does this credential have a verified transcript, available in a standard, recognizable format, which shows not only the specific courses completed and grades achieved, but also extended transcript infor-

mation providing much more detail and evidence?

- Do the circulation, endorsements, and uses of badges from this credential illuminate the specific competencies within the credential and how they provide value in various ecosystems?
- Does evidence of the career, further education, and social paths of graduates freely circulate in social networks and online sites?
- Do employers see the value of employees who have earned this credential, as demonstrated in their job performance, aptitude, ability to learn on the job, longevity with the company, and other factors? Are they more likely to seek new employees who have this credential or even change their hiring practices to explicitly recommend or require this credential?

VALIDITY

- Is this credential industry-recognized, accredited, or otherwise validated by third parties? Which ones?
- Are the competencies represented by this credential well-articulated to the actual, current requirements from the field?
- Is this credential recognized by state, national, and/or regional agencies?
- Is this credential endorsed by industry organizations?
- Is this credential endorsed by a variety of relevant credential consumers?
- Have reputation networks, including new types of endorsers, emerged around this credential, providing insights into its value?
- Do social networks and analytics illuminate aspects of this credential's value?
- Are the content and competencies included in this credential transparently communicated and recognized as being appropriate to the credential?
- Are earners of this credential able to do what the credential claims they can do?

EQUITY

- What types of educational, social, and/or economic mobility does this credential enable?
- Do you provide on-ramps and practical supports that enable access for students with varying abilities and preparation?
- What options do students have for achieving related or stackable credentials flexibly, including stopping and starting education over

time? Does this credential and its relationships to other credentials help individuals build qualifications and move along clear pathways to further education and/or better career opportunities?

- How specifically do the modular units of this credential in and of themselves provide value to help people advance in careers and other contexts? Can students who do not complete this credential still use badges earned as modular evidence of competencies?
- Can students stop and start their education and use the modular competencies and credentials they have earned to continue along pathways to more comprehensive and/or specialized credentials?
- How specifically does this credential's transparency help students understand and document their own learning pathways to employment and further growth?
- Are students provided with clear and thorough guidance on how credit for prior learning and transfer credits can be applied to their progress toward this credential?
- Does this credential have clearly defined practices for accepting a broad range of CREDIT recommendations that represent students' military training, employment training, professional examinations, education from nontraditional providers, and other learning from outside the institution?
- Are students provided with formal career guidance and mentoring services throughout their progress toward this credential?
- Are the career paths of graduates who have earned this credential accurately reported so that students have information about the value of the credential for their own decision making? Are general information and data supplemented with testimonials from the graduates themselves and social networks for prospective students to connect with graduates? Are prospective students socialized into the challenges and opportunities of earning this credential before they even begin?

Conclusion: Call to Action

The scope and direction of these questions cross traditional boundaries and challenge many of the policies, practices, roles, and responsibilities in our postsecondary credentialing ecosystems. However, a willingness to ask and seek answers to these questions is an essential first step in breaking down the credentialing silos that sometimes impede student progress and cause our systems to be less effective and beneficial than they could be.

Based on the awareness that approaches to improving quality for connected credentials will differ widely across our diverse postsecondary systems, this paper has provided a range of ideas that can be used to visualize and shape potential futures in a variety of ways. Dialogue can start among institutional colleagues, branch out to additional educational and labor market partners, and eventually engage other currently disconnected credentialing stakeholders. State bodies can play an important facilitative role in furthering this dialogue using their influence across education, the workforce, and economic development.

We encourage you to complete the arc of your journey: Identify your credentialing ecosystem stakeholders, articulate the problems they encounter when credentials are not connected, use the challenge questions to analyze and discuss the current state of your specific credentials with regard to the quality dimensions, and then establish a realistic plan and timeline for developing more valuable, robust, and connected credentials that reflect your new approach.

The following suggestions can have local impact at your own institution and serve as catalysts in your communities of practice:

- Use the challenge questions above to select a specific approach to a specific credential problem at your own institution.
- Create a working group with local higher education institutions to review and implement connected credentials among traditional partners.
- Analyze how a credential at your institution can connect to a different type of credential that your institution does not provide, such as a license or certification.
- Incubate a new, granular credential that is portable and interoperable, e.g., as a representation of a single competency. Create a badge for the credential and award it as part of a program of study. Analyze the uses of this credential and its currency value among stakeholders.
- Form new or strengthen existing partnerships with employers.
- Organize a summit on connected credentials with local stakeholders, including employers and industry organizations.

A willingness to ask and seek answers to these questions is an essential first step in breaking down the credentialing silos that sometimes impede student progress and cause our systems to be less effective and beneficial than they could be.

- Write scenarios that depict processes for improving credentials through collaboration among stakeholders.
- Get involved with Connecting Credentials, the Credential Transparency Initiative, IMS Global working groups, and other community efforts.
- Read the ACE paper *Communicating the Value of Competencies* and explore the complementary value of competencies and credentials.
- Produce edited books and journal articles on what connected and new credentials mean for our U.S. higher education systems. Help to define "connected" and "new" rather than "alternative," because "alternative" implies insiders/outsiders, and not ecosystems.
- Host workshops, convenings, and other events on new and connected credentials.
- Research aspects of the economic impact of connected credentials, such as the economics of higher education institutions, the potential return on investment for individuals, and economic development in specific locales or sectors.
- Network with professional organizations and state agencies, including economic development councils, to share lessons learned and successful policies and practices related to credentialing so that they can be more broadly adopted and scaled.
- Work with the Department of Education through Educational Quality Through Innovative Partnerships (and the associated Quality Assurance Entities) to produce a study on the effectiveness of collaborations between traditional and nontraditional education providers. Explore how these collaborations could extend to new credentialing models (U.S. Department of Education 2016).
- Establish an innovation and research lab for connected and new credentials. The lab could work collaboratively with other interested organizations to create, pilot, and assess a variety of credentials; create ecosystems among universities, associations, and employers; research and document the benefits of these ecosystems, etc.

Positive change will flourish when we articulate and implement specific improvements that address relevant problems.

Recognition of current problems, while necessary, is insufficient. Positive change will flourish when we articulate and implement specific improvements that address relevant problems. The quality dimensions described in this paper provide a framework for visualizing connected credentialing ecosystems that add value and meet the needs of stakeholders. Many national, state, institutional, and private-sector initiatives provide examples and guidance on how these ideas can be implemented and scaled within our highly complex and decentralized environments. We need to capture learning about what works from these innovations and continually refine approaches to create dynamic systems that combine rigor and agility to produce credentials valued by all stakeholders—employers, government, educators, job seekers, and learners.

REFERENCES

Association of American Colleges and Universities. 2016. "Introduction to LEAP." Accessed January 6. **http://aacu.org/leap/introduction-to-leap**.

Badge Alliance. 2016. "Open Badges Standard." Accessed January 6. **http://www.badgealliance.org/open-badges-standard/**.

Bielick, Stacey, Stephanie Cronen, Celeste Stone, Jill M. Montaquila, and Shelley Brock Roth. 2013. *The Adult Education Training and Education Survey (ATES) Pilot Study*. Washington, DC: U.S. Department of Education. **https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2013190**.

Burning Glass Technologies. 2014. *Moving the Goalposts: How Demand for a Bachelor's Degree Is Reshaping the Workforce*. Boston: Burning Glass Technologies. **http://burning-glass.com/wp-content/uploads/Moving_the_Goalposts.pdf**.

Carnevale, Anthony P., Nicole Smith, and Jeff Strohl. 2013. *Recovery: Job Growth and Education Requirements Through 2020*. Washington, DC: Georgetown University Center on Education and the Workforce. **https://cew.georgetown.edu/report/recovery-job-growth-and-education-requirements-through-2020/**.

Casilli, Carla, and Erin Knight. 2012. *7 Things You Should Know About Badges*. Washington, DC: EDUCAUSE. **http://www.educause.edu/library/resources/7-things-you-should-know-about-badges**.

Center for Law and Social Policy. 2014. "Shared Vision, Strong Systems: The Alliance for Quality Career Pathways Framework Version 1.0." Washington, DC: Center for Law and Social Policy. **http://www.clasp.org/issues/postsecondary/pages/aqcp-framework-version-1-0**.

Derryberry, Anne, Deborah Everhart, and Erin Knight. 2016. "Badges and Competencies: New Currency for Professional Credentials." In *Digital Badges in Education: Trends, Issues, and Cases*, edited by Lin Y. Muilenburg and Zane L. Berge. New York: Routledge.

Everhart, Deborah, Deb Bushway, and David Schejbal. 2016. *Communicating the Value of Competencies*. Washington, DC: American Council on Education.

Ganzglass, Evelyn. 2014. *Scaling "Stackable Credentials": Implications for Implementation and Policy*. Center for Postsecondary and Economic Success at the Center for Law and Social Policy. **http://www.clasp.org/resources-and-publications/files/2014-03-21-Stackable-Credentials-Paper-FINAL.pdf**.

Lumina Foundation. 2015a. *Connecting Credentials: A Beta Credentials Framework*. Indianapolis: Lumina Foundation. **http://connectingcredentials.org/wp-content/uploads/2015/05/ConnectingCredentials-4-29-30.pdf**.

Lumina Foundation. 2015b. *Connecting Credentials: Making the Case for Reforming the U.S. Credentialing System*. Indianapolis: Lumina Foundation. **http://connectingcredentials.org/wp-content/uploads/2015/06/MakingTheCase-6-8-15.pdf**.

Lumina Foundation. 2016. "New to the DQP/Tuning?" *DQP: Degree Qualifications Profile*. Lumina Foundation and National Institute for Learning Outcomes Assessment. **http://degreeprofile.org/new-to-the-dqp/**.

McCarthy, Mary Alice. 2014. *Beyond the Skills Gap: Making Education Work for Students, Employers, and Communities*. Washington, DC: New America. **https://www.newamerica.org/education-policy/beyond-the-skills-gap/**.

Soares, Louis. 2013. *Post-traditional Learners and the Transformation of Postsecondary Education: A Manifesto for College Leaders*. Washington, DC: American Council on Education. **http://www.acenet.edu/news-room/Pages/Post-traditional-Learners-and-the-Transformation-of-Postsecondary-Ed.aspx**.

State University of New York Empire State College. 2016. "Global Learning Qualifications Framework." Accessed January 6. **http://www.esc.edu/suny-real/global-learning-qualifications-framework/**.

U.S. Department of Education. 2016. "Educational Quality through Innovative Partnerships (EQUIP)." Accessed January 6. **http://tech.ed.gov/equip/**.

U.S. Department of Education, Office of Career, Technical, and Adult Education. 2015. *The Evolution and Potential of Career Pathways*. Washington, DC: U.S. Department of Education. **http://connectingcredentials.org/wp-content/uploads/2015/05/The-Evolution-and-Potential-of-Career-Pathways.pdf**.

U.S. Department of the Treasury Office of Economic Policy, U.S. Council of Economic Advisers, and U.S. Department of Labor. 2015. *Occupational Licensing: A Framework for Policymakers*. Washington, DC: The White House. **https://www.whitehouse.gov/sites/default/files/docs/licensing_report_final_nonembargo.pdf**.

ACE® American Council on Education®