

# CONNECTING CREDENTIALS

## A BETA CREDENTIALS FRAMEWORK

Building a system for communicating  
about and connecting diverse credentials



A BETA



# CREDENTIALS FRAMEWORK

## What it is and why it's needed

Today's marketplace for postsecondary education credentials is highly fragmented, ranging from badges and industry-based certifications to two- and four-year degrees and beyond. It's a complex, multi-layered ecosystem that presents major challenges for students, employers, workers and policymakers. Individuals encounter too many dead ends as they work to gain the skills and credentials they need to advance. Employers have lost trust in some credentials as they seek the skilled employees they need to compete globally. Policymakers at all levels are unsure about how to assure quality education and credentials in an increasingly diversified learning environment.

Over the past 30 years, there's been a surge – an increase of more than 800 percent – in the number of certificates awarded by higher education institutions and other providers of education and training. At the same time, the number of certifications offered by industry-based organizations has grown extensively. The immense growth of online learning and the development of new kinds of credentials such as badges compound the problem further. Validation

of credentials is uneven, too. While the nation boasts more than 4,000 personnel-certification bodies, less than 10 percent of them are accredited or reviewed by a third party.

In short, the credentialing world is confusing, at times even chaotic. To enhance the utility of credentials and reduce the costs borne by individuals and employers, we need a common language – a unified analytic framework that helps stakeholders compare the value and suitability of different types of credentials. This beta Credentials Framework, developed on behalf of Lumina Foundation by experts from the Corporation for a Skilled Workforce (CSW) and the Center for Law and Social Policy (CLASP), aims to fill that need.

The Framework uses competencies – what the learner knows and is able to do – as common reference points to help understand and compare the levels and types of knowledge and skills that underlie degrees, certificates, industry certifications, licenses, apprenticeships, badges and other credentials. Competencies are understood both in industry and academia and can be applied in multiple contexts, making them a powerful unifying way to examine credentials.

## History and context: How the Framework came to be

Lumina Foundation has long worked toward one aim – an education-attainment goal whose achievement is critical to the nation's social progress and its economic future. That goal, Goal 2025, calls for 60 percent of Americans to hold a college degree or other high-quality postsecondary credential within 10 years – by 2025. In pursuing that goal, we're committed not only to increase the number of credentials earned, but also to ensure the quality of those credentials. In other words, we want to ensure that postsecondary credentials represent genuine learning of the knowledge and skills that students need to succeed in the workplace and in life.

This commitment to defining educational quality in terms of student learning has driven much of our work in recent years, including the creation of the Degree Qualifications Profile (DQP). The DQP – drafted in beta form in 2011 and honed by more than five years of testing on hundreds of campuses all over the nation – is a baseline set of reference points for what college graduates (i.e., those awarded associate, bachelor's or master's degrees) should know and be able to do. In short, it is a tool for ensuring high-quality learning at the college level – not the only tool, of course, but certainly one that has proven its value.

One way the DQP has been valuable is that it has underscored the need for a larger and more comprehensive framework – one that

incorporates not only degrees, but all postsecondary credentials, from badges and other forms of "micro-credentialing" all the way through advanced degrees and post-doctoral study. This document, the beta Credentials Framework, is our initial attempt to meet that need.

We at Lumina are convinced that this Framework that connects credentials, once fully fleshed out and rigorously tested, will be of great benefit because it can help create clear and multiple pathways for students as they seek to build – and rebuild – their careers and lives. What's more, we see such a framework as a tool in a larger and even more vital effort; that is, redesigning the nation's current postsecondary system into one that it is truly learning-based and student-centered.

We know full well that this redesign effort – and the task of creating a viable, comprehensive framework – are both long-term projects. In fact, neither will be accomplished without many years of diligent and cooperative effort among a range of individuals, organizations and institutions. Still, we also know that we're not alone in this work. A national dialogue is already underway about how to create a more seamless and comprehensive system of credentials. We hope this document helps stimulate and support that dialogue. To that end, we encourage you to review this Framework, to test its application at your institution or organization, and to share your views at [www.connectingcredentials.org](http://www.connectingcredentials.org).

The Framework is intended to connect the dots among diverse credentials by using a common language to describe what recipients of each credential should know and be able to do. Use of the Framework will help clarify the meaning of credentials, make them easier to compare, and make it possible to translate the learning gained from one credential toward securing another.

If you're developing and awarding credentials, using them to hire employees, creating competency-based curriculum, or helping students find a career pathway, the Framework has been developed to support your work.

## The value of the Framework

By providing common language and a unified framework for understanding the competencies associated with different credentials, applications of the Framework can improve all of the following:

- **Equity.** More transparent credentials create clearly visible pathways to increase career and economic mobility for historically underserved and underrepresented populations, including African American, Latino and Native American students.
- **Credential transparency.** The Framework makes it easier to understand the competencies associated with any credential.
- **Comparability.** It makes it possible for stakeholders to compare the value of various credentials and determine which credential best fits their needs.
- **Portability.** It supports the translation of learning acquired across institutions and between academic institutions and employers.

Tools based on the Framework can help individuals and companies reduce the time and cost required to complete credentials. The Framework can also lead to better-informed choices about education and employment and about the hiring and promotion of workers. Specific potential applications include facilitating:

- Credit transfer.
- Secondary/postsecondary articulation.

- Matching job competencies with credentials.
- Cross-walking competencies across multiple credentials.
- Assessment of learning outcomes in a variety of contexts including classroom, work-based and online learning.
- Assessment and award of credit for prior learning.
- Developing career pathways and credential “stacking.”
- Increasing employer use of credentials.
- Educational program development and review.
- College and career advising/navigating.

## Guidelines for interpreting the beta Credentials Framework

- For the sake of clarity, the competencies for each domain are described independently. However, domains are complementary. In practice, specific competencies reflect a person's ability to apply a combination of knowledge and skills. The same point applies to learners' actual development of the expected competencies. Students learn what they practice, and they frequently encounter assignments or tasks with respect to academic, non-academic, societal and work demands that require them to integrate knowledge, specific skills and applications.
- Different credentials represent different patterns of competency attainment across domains. There is no presumptive level for any type of credential, and the profile of any specific credential includes a different level for each domain. The competencies described at each level may be found in multiple credentials.
- Characteristics already described at one level are not repeated at higher levels unless additional elaboration is required.
- Learners can attain the competencies expressed at each level through many learning paths – sequential and non-sequential. The competency levels do not assume that credentials must be acquired in the same sequence. In practice, many learners will start at a lower competency level and progress to higher levels. But it is also possible to gain two different credentials that have similar competency profiles – or to progress from a credential with a higher competency profile to one with a lower-level profile – if new learning and skills

## How it's organized

*The beta Credentials Framework is:*

- Organized around competencies that 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*.
- Structured in eight *levels* that indicate the relative complexity, breadth and/or depth of learning achievement, rather than subject matter.
- Flexible, in that it allows for precise analysis and reflection on the

attributes of each individual credential rather than attempting to peg all credentials of a certain type to a fixed level.

- Able to establish a profile of levels of knowledge and skills associated with a given credential as well as an aggregate level of that credential. *Application* of knowledge and skills is embedded throughout the Framework; application is crucial to ensure that knowledge and skills are meaningful.

are acquired. For example, an IT certification could be earned during high school, but it could also be of value to a mid-career worker who holds a master's degree.

- Just as learning is cumulative but rarely follows a rigid sequence, evidence for learning is cumulative and reflects programmatic and individual differences in institutional and labor market needs and choices.
- The competencies are presented through active verbs that declare what learners should do to demonstrate mastery. These active verbs are deliberately cast at increasing levels of difficulty or complexity.
- The competency descriptors and level indicators do not prescribe how well a learner must perform to demonstrate mastery. They are meant to support assessment and demonstration that the student has achieved the competencies associated with specific credentials.
- The Framework refers to *knowledge* and *skills*, with the latter being divided into *specialized*, *personal* and *social skills*. Personal and social skills refer to a wide range of skills that all individuals need to succeed, regardless of educational discipline or occupation. In some frameworks, particularly the “KSA” frameworks used in employment settings, these skills are called “abilities.” We chose to classify them as skills to emphasize the fact that they can be learned.

## How the Framework was developed and will be improved

The beta version of the Credentials Framework was developed by a team led by CSW and CLASP, with input from dozens of experts from colleges, industry, certification/accreditation agencies and policy organizations. Four industry panels of educators and industry representatives were convened to explore the dynamics of credentialing in each selected industry and identify cross-industry patterns. Credential users from colleges and industry mapped dozens of specific educational certificates, degrees and industry certifications against a prior draft of the Framework to test its workability.

The overall consensus of that input strongly supported continuing development of the Framework, and many of the participants articulated potential value propositions for its use.

Framework developers closely examined many other frameworks being developed and used in the U.S. and internationally. The Framework is designed to align with key U.S.-based tools including Lumina Foundation's Degree Qualifications Profile and Tuning initiative, and the Employability Skills Framework developed by the National Network of Business and Industry Associations.

The beta Credentials Framework draws on language and concepts found in each of those sources and attempts to use language that can be understood and related equally well by business, learners and educators.

Development of the beta Credentials Framework complements numerous efforts underway throughout the country to increase interoperability and transparency about learning and labor market outcomes in the credentialing marketplace, and promote competency-based education, credentialing and hiring practices. It also is aligned with initiatives to increase portability of credentials and recognition of learning regardless of where it occurs.

In addition, the Framework is part of an international movement to use outcome-based measures as a catalytic tool for increasing the connectivity between academic and occupational credentials. The Framework's design was informed by examination of similar frameworks being used in other countries, many of which are based on the European Qualifications Framework.

The beta Credentials Framework is intended to be a tool that will be improved regularly based on input from users. In fact, the beta version restructured the competency domains and changed the number of levels from 10 to eight based on feedback to an initial draft.

During the Credentials Framework's beta phase, four types of work will be undertaken to improve it:

- 1 Map credentials of all forms to assess the ease and integrity of profiling through use of the Framework. Further credential mapping is encouraged and is being actively undertaken to validate initial design decisions.
- 2 Convene a technical review team to examine the internal structure of the Framework. The team includes industrial and educational psychologists, instructional designers, human resource talent-development professionals, and experts on international qualification frameworks.
- 3 Conduct proof-of-concept experimentation using “real world” applications to assess and refine the Framework design choices. This field work will help identify ways in which the Framework can be made most useful and will provide a means to identify and address technical and logistical issues.
- 4 Use insights from the ongoing national dialogue on credentialing to improve the Framework. The recently launched dialogue, co-sponsored by Lumina Foundation and more than 40 partner organizations, offers an opportunity to gain extensive stakeholder input.



# Eight levels of the Framework

## **Join the dialogue**

We invite you to explore and use the beta Credentials Framework, and we encourage you to share what you learn with the growing network of organizations engaged in a national dialogue about the nation's credentialing system. To join the conversation, visit: [www.connectingcredentials.org](http://www.connectingcredentials.org). For information about testing or experimenting with the Framework, please contact Larry Good at [lagood@skilledwork.org](mailto:lagood@skilledwork.org).



# 8

## LEVELS

The level requirements and competencies in study and work are described in terms of the degree of:

- Adaptability
- Complexity
- Range
- Selectivity

## KNOWLEDGE

**Knowledge describes what a learner knows, understands and can demonstrate in terms of the body of facts, principles, theories and practices related to fields of application (study and work). The requirements and competencies are described in terms of:**

- Depth
- Breadth
- Dimension

# 1

**Level 1** Demonstrates achievement of fundamental competencies to complete narrow and limited tasks within a highly structured field of study or work under direct supervision or guidance.

- Demonstrates general knowledge within predetermined fields of study or work.

# 2

**Level 2** Demonstrates achievement of fundamental competencies to complete technical, routine tasks within a structured field of study or work largely subject to overall direction or guidance.

- Demonstrates and uses basic knowledge within a field of study or work that includes relevant principles and practices.

# 3

**Level 3** Demonstrates competencies for processing well-defined technical tasks that are less structured and include non-routine tasks. These tasks have some degree of complexity, assigned within a comprehensive field of study or occupational activity subject to some change and largely subject to overall supervision or guidance.

- Demonstrates and applies extended knowledge within a field of study or field of occupational activity.
- This includes the knowledge of a limited range of technical and theoretical concepts, procedures and solutions to predictable problems.

# 4

**Level 4** Demonstrates competencies for the processing of specialized and complex tasks within a comprehensive field of study or an occupational environment that is subject to change. This requires theoretical knowledge and practical skills to select appropriate principles and procedures and may involve overall supervision.

- Demonstrates a comprehensive theoretical and technical knowledge within a field of study or an occupational field to determine solutions to unfamiliar patterns.

# 5

**Level 5** Demonstrates advanced competencies for the processing of comprehensive tasks assigned within a complex and specialized field of study or occupational activity subject to change. This requires the ability to select and apply appropriate theoretical knowledge and practical skills to perform technical tasks in a broad range of contexts.

- Demonstrates integrated and specialized professional knowledge within a field of study or occupational activity.
- This includes deeper theoretical and professional knowledge, including the scope, the core theories and practices and the limitations of the field of study or field of occupational activity.

# 6

**Level 6** Demonstrates mastery in the processing of comprehensive tasks and problems within subareas of a field of study or within a field of occupational activity characterized by a high degree of complexity and by frequent changes. This requires a high degree of theoretical knowledge and practical skills.

- Demonstrates broad integrated knowledge concerning scientific principles and the practical application of a scientific or complex subject.
- This includes a critical understanding of the most important theories, a range of methods as well as relevant and innovative occupational and technical developments to address complex problems.
- Demonstrates knowledge related to the further development of a scientific or complex subject, a field of occupational activity or relevant knowledge at the interface of different areas.

# 7

**Level 7** Demonstrates competencies for the processing of new and complex professional tasks and problem settings within a scientific subject or an occupational field characterized by frequent and unpredictable changes. This requires the need to elucidate the major theories and the application of advanced specialized knowledge, research methods and approaches in various contexts.

- Demonstrates comprehensive, detailed, specialized and state-of-the-art knowledge in a scientific subject or in a strategically oriented field of professional activity.
- This includes demonstrating an extended knowledge in adjoining areas of study or work, major theories, methods and schools of practice in the field of study or profession, and their relationships to allied fields.

# 8

**Level 8** Demonstrates competencies for obtaining research findings in a scientific subject or for the development of innovative solutions and procedures in highly complex and novel problem situations within a field of occupational activity. This requires a capacity for a wide range of strategic and scientific thinking and creative action.

- Demonstrates comprehensive, specialized, systematic state-of-the-art knowledge in a discipline or profession and contributes to innovation or the expansion of knowledge.
- This includes specialized knowledge at the interface of adjoining disciplines or areas of practice that may include the acquisition and application of knowledge in a new discipline or professional area.

# SKILLS

**Skills** describe what an individual can do in applying knowledge, completing tasks, and solving problems (involving the use of logical, intuitive and creative thinking). Skills can be described in terms of types and complexity and include cognitive, technical, communication, interpersonal and practical skills (involving manual dexterity and the use of methods, materials, tools and instruments).

**Specialized skills** include occupational and discipline-specific skills.

**Personal skills** describe the competency required to act in an independent and responsible manner in various situations, to exercise judgment and demonstrate critical thinking and problem solving.

**Social skills** describe the individual's ability to demonstrate respect for the behavior of others and differing viewpoints, to communicate with others effectively, and to work effectively with people from diverse backgrounds and points of view.

## SPECIALIZED SKILLS

The requirements and competencies are described in terms of:

- Critical Thinking and Judgment
- Integrative Application
- Systems Thinking

<ul style="list-style-type: none"> <li>• Demonstrates basic cognitive and practical skills required to carry out tasks with stipulated rules.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates ability to recognize and to act on elementary relationships between assignments and tasks.</li> </ul>
<ul style="list-style-type: none"> <li>• Demonstrates basic cognitive and practical skills required to carry out tasks within a field of study or work.</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluates the results of such tasks in accordance with pre-stipulated criteria and establishes correlations among functions and tasks.</li> </ul>
<ul style="list-style-type: none"> <li>• Demonstrates a broad range of cognitive and practical skills which facilitate autonomous preparation for performing tasks and problem solving, identifying and using relevant methods and skills to complete tasks and to address well-defined problems having a measure of complexity.</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluates results in accordance with criteria which are largely pre-stipulated, provides simple reporting of methods and results.</li> </ul>
<ul style="list-style-type: none"> <li>• Demonstrates the use of a broad range of cognitive and practical skills which facilitate problem solving and the completion of complex tasks.</li> <li>• Plans and designs appropriate approaches and processes, evaluates work and learning results.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates ability to select alternative actions or practices based on observations of reciprocal effects on other functional areas or tasks.</li> </ul>
<ul style="list-style-type: none"> <li>• Demonstrates an extended, broad range of specialized cognitive and practical skills.</li> <li>• Identifies and frames complex problems in selected areas of study and work, and distinguishes among ideas, concepts, theories or practical approaches to solve those problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Plans work processes across learning and work areas. Evaluates such processes, comprehensively considering alternatives and their potential impacts.</li> </ul>
<ul style="list-style-type: none"> <li>• Demonstrates and applies a comprehensive range of methods for processing complex tasks and problems within a scientific subject, field of study or field of professional activity.</li> <li>• Differentiates and evaluates theories and approaches to selected complex problems within the chosen field of study or professional activity.</li> </ul>	<ul style="list-style-type: none"> <li>• Develops and evaluates new solutions and considers the effect on various criteria even in circumstances where requirements are subject to frequent change.</li> </ul>
<ul style="list-style-type: none"> <li>• Demonstrates specialized technical or conceptual skills to analyze, consolidate and synthesize knowledge in order to identify and to provide solutions to strategic problems in a scientific subject or in a field of professional activity.</li> </ul>	<ul style="list-style-type: none"> <li>• This includes the initiation, planning and evaluation of varied specialized technical or creative functions, the exploration of current limits of theory, knowledge and practice, and the consideration of alternatives.</li> <li>• Demonstrates high-level, independent judgments in a range of technical or management functions and articulates significant challenges involved.</li> </ul>
<ul style="list-style-type: none"> <li>• Demonstrates and applies skills in making high-level, independent judgments in a range of technical or management functions in varied specialized contexts. This includes the initiation, planning and evaluation of broad specialized technical and creative functions comprising cross-activity areas and the consideration of alternatives.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates comprehensively developed skills for the identification and solution of novel problems set in the areas of research, development or innovation within a specialized scientific subject or in a field of professional activity.</li> </ul>

# PERSONAL SKILLS

The requirements and competencies are described in terms of:

- **Autonomy**
- **Responsibility**
- **Self-Awareness and Reflectiveness**

- Acknowledges one's own actions while performing tasks.
- Demonstrates taking responsibility for learning and the outcomes of structured activities in familiar and stable contexts.
- Takes individual responsibility for completing tasks and procedures within a limited range of contexts.
- Uses stipulated learning guides and requests learning guidance when needed.
- Exercises some autonomy subject to overall direction and guidance.
- Performs tasks, employs procedures, and attains a quality of output with considerable responsibility and autonomy within contexts which are less familiar and stable, subject to overall direction or guidance.
- Acknowledges different perspectives or approaches within an area of study or work.
- Sets one's own learning and work objectives, and takes responsibility for them.
- Demonstrates initiative in planning and designing technical, management or learning functions.
- Reflects, assesses such objectives and takes responsibility for them.
- Sets one's own learning and work objectives.
- Demonstrates persistence and flexibility in attaining objectives.
- Takes responsibility for overall actions and results as well as exercises autonomy within broader parameters.
- Undertakes self-directed pursuit of objectives and takes responsibility for such objectives.
- Reflects understanding of different perspectives or approaches within an area of study and work.
- Reflects and assesses one's own and externally set learning objectives.
- Exercises broad autonomy and responsibility for planning and developing of learning and work processes that are capable of underpinning substantial changes or developments.
- Defines, reflects and assesses autonomously and sustainably the objectives for learning and work processes and structures learning and work processes.
- Evaluates the strengths and weaknesses of these processes, and, where applicable, describes the result.
- Exercises broad autonomy across a significant area of work or study and takes responsibility for planning and developing actions in learning and work that initiate complex tasks or underpin substantial changes or developments.
- Defines objectives for new applications or research-oriented tasks reflecting on possible societal, economic and cultural implications.
- Exercises comprehensive autonomy as a leading scholar or practitioner and takes responsibility for planning and developing actions in learning and the advancement of professional practice that have a significant impact on the field of work or knowledge, or result in substantial organizational or professional change.
- Defines objectives for new complex applications or research-oriented tasks.
- Selects appropriate means and develops new ideas and processes.

## SOCIAL SKILLS

The requirements and competencies are described in terms of:

- Communication
- Involvement
- Teamwork and Leadership

- Demonstrates respect for the actions of others while performing tasks.
- Accepts and expresses general feedback and critique.
- Demonstrates ability to work within a group in familiar and stable contexts.

- Demonstrates basic interpersonal and communication abilities required to learn and exchange knowledge with others in study and workplace contexts.
- Demonstrates listening and following brief highly structured directions requiring limited attention.

1

- Demonstrates intermediate interpersonal abilities required in learning and the workplace.
- Uses communication abilities to transfer some knowledge and specialized skills to others.

- Uses effective listening and comprehension skills for receiving direction or information from others.

2

- Demonstrates strong interpersonal abilities required in learning and in the workplace, in particular the ability to:
  - 1.) articulate processes and results,
  - 2.) share and receive specialized knowledge when required and
  - 3.) demonstrate and explain skills to others.

- Learns and works in complex and heterogeneous groups.
- Helps shape the work within a group in a learning or working environment.
- Presents clear, timely and relevant information on processes and results to the appropriate recipients.

3

- Demonstrates advanced interpersonal abilities required in learning and in the workplace, in particular the ability to communicate effectively about solutions to complex problems when the subject matter may be moderately sensitive, controversial or likely to be questioned or challenged.

- Assists in shaping the work in a group according to the learning or work environment of such a group while offering ongoing support.

4

- Plans and structures work processes in a collaborative manner, including within heterogeneous groups.
- Acts in an anticipatory manner while considering the interests and requirements of others.
- Evaluates the potential consequences for work processes within teams, instructs others and provides well-founded learning guidance.

- Demonstrates advanced interpersonal abilities required in learning and in the workplace, including the ability to present complex facts and circumstances and to communicate about solutions in a manner that is contextually appropriate to cross-disciplinary audiences.

5

- Takes responsibility while working in expert teams and shows responsibility in leading groups or organizations.
- Instructs the professional development of others and acts in an anticipatory manner to address problems within teams.

- Demonstrates advanced interpersonal abilities required in learning and in the workplace, including the ability to comprehensively and clearly communicate about methods, technologies, knowledge and ideas. This includes the ability to present arguments and solutions to complex problems, even when subject matter is highly complex, unfamiliar or technical.

6

- Takes responsibility for leading groups, organizations or, where relevant, for work and roles of others within the scope of complex tasks.
- Promotes the professional development of others in a targeted manner.

- Demonstrates appropriate communications abilities to lead expert debates on new ideas and problems in a specific discipline and across disciplines or in a professional field and related areas.
- Demonstrates the ability to build consensus and apply negotiating practices in a group or interactive environment.

7

- Leads groups or organizations in complex or interdisciplinary tasks while activating the areas of potential within such groups or organizations.
- Demonstrates deep levels of interpersonal abilities required in learning and the workplace. In particular, demonstrates communication abilities to transfer knowledge and specialized skills to others.

- Leads cross-specialty debates in a targeted and sustained manner and introduces innovative contributions to specialized professional discussions.

8

## Definitions of key terms

The definitions cited here reflect their meaning in the context of the beta Credentials Framework. This list will be reviewed and adjusted as needed on a regular basis. The definitions represent combinations of those developed and used in other related initiatives and were thus developed by drawing on multiple sources.

**Adaptability:** The degree of ability to perform in work or study situations that range from repetitive and predictable with predetermined instruction and manuals to non-routine and less predictable circumstances. This term refers as well to the ability to respond to abstract problems that expand and often require redefinition of existing practices and procedures.

**Alternative and informal learning:** Numerous opportunities that learners have outside traditional educational institutions to acquire competency, including necessary knowledge and/or skills required to earn credentials and, in some cases, pass competency-based assessments. Some of these alternative methods include: prior learning assessments (PLAs), military and apprenticeship experience, work-based learning, self-directed learning and massive open online courses (MOOCs).

**Applied and collaborative learning:** A category of learning focused on what students can do with what they know, demonstrated by innovation and fluency in addressing both conventional and unscripted problems in the classroom, beyond the classroom and at work. This category includes both undergraduate research and creative activities involving individual and group effort — and may include specific practical skills crucial to the application of expertise.

**Apprenticeship:** A systematic, long-term program combining on-the-job learning at a workplace and focused, theoretical study at an educational institution or training center. In many programs, the apprentice is contractually linked to the employer and receives remuneration (wage or allowance). The employer assumes responsibility for providing the trainee with training leading to a specific occupation.

**Autonomy:** The ability to apply knowledge and skills in an independent and responsible manner leading to accomplishments. This ability requires reflection on personal decisions and those of others in order to continue to develop one's own abilities and effectiveness.

**Body of knowledge:** A complete set of concepts, terms, and activities that make up a field of study or occupational/professional activity.

**Breadth:** The range of content expressed in the learning outcomes included in one or more academic fields and the range of general, occupational or technical skills associated with a specific credential.

**Broad and integrative knowledge:** A category of learning focusing on the proficiency of students in bringing together learning from different fields of study.

**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.

**Certificate:** A credential that is offered by private and public institutions and is not typically held to psychometric standards required of certifications. Three types of certificate programs are: knowledge-based, curriculum-based, and participation-based. Knowledge-based certificates are awarded based on mastery of subject matter knowledge. Curriculum-based certificates are awarded after an individual completes a program of study. Participation-based certificates are awarded based on attendance in a course.

**Certification:** A credential that is issued as a result of a voluntary assessment process whereby an individual's competencies are verified against a set of predetermined skill standards or other standardized objective criteria. The credential can be used for high stakes applications because it is based on existing legal and psychometric requirements.

**Civic and global learning:** A category of learning focused on a student's ability to articulate and respond to political, social, environmental and economic challenges at local, national and global levels.

**Communication:** The exchange of information, physically, orally and in writing, with individuals, teams, organizations and external audiences using multiple modes, including informational technology and related applications.

**Competency:** A learnable, measurable, role-relevant, and behavior-based characteristic or capability of an individual.

**Complexity:** The characterization of information, problems, situations and theories that interact with each other in multiple ways.

**Continuous improvement:** The ongoing review and analysis processes that assure that credentials and their related components (competencies, skill standards, curricula, and assessments) remain updated and relevant as knowledge and skill set requirements change. This continuous improvement activity ensures that organizations continue their ability to offer quality training/education and credentials.

**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.

**Credit hour:** A unit of measurement for completion of a college course. Traditionally based on the time spent in its pursuit, the credit hour is also applied as a proxy for time in the demonstration of competencies through assessments and portfolios.

**Critical thinking and judgment:** The application of disciplined thinking that is clear, rational, open-minded, critical, and informed by evidence in drawing conclusions and evaluating the subsequent decisions.

**Degree Qualifications Profile and Tuning:** The DQP is a learning-centered framework for what college graduates should know and be able to do to earn the associate, bachelor's or master's degree. Tuning is a faculty-led, discipline-by-discipline attempt to determine what students should know and be able to do at applicable stages of a discipline's curriculum.

**Depth:** The degree of knowledge and skills required in a specific body of knowledge in an area of general, occupational or technical knowledge. Depth often refers to partial vs. complete knowledge or knowledge across a cognitive continuum from recall of facts to conceptual understanding.

**Dimensions:** A frame of reference or coordinates for a range of facts, concepts, theories and practice often from concrete to abstract and from segmented to cumulative.

**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.

**Discipline:** A field of study, whether academic (e.g., history, accounting, geology) or professional (e.g., medicine, law, engineering). For undergraduates, discipline is often synonymous with major and field of study.

**Employability skills:** Foundational academic, practical and interpersonal skills required across industries and career paths as categorized under: applied knowledge; personal skills; people skills; and workplace skills.

**Field of study:** Term used synonymously with discipline but also used to describe applied, occupational or technically oriented programs such as culinary arts, automotive technology and graphic design.

**Integrative application:** The application of intellectual competencies (reading, writing, computational, etc.), theories, methodologies, scientific principles, tools and technology spanning all aspects of a discipline or field of study and employment relevant to a given set of work or study.

**Intellectual skills:** Proficiencies that transcend the boundaries of particular fields of study and overlap, interact with, and enable other major areas of learning. Intellectual skills include analytic inquiry, use of information resources, engaging diverse perspectives, ethical reasoning, quantitative fluency and communicative fluency.

**Involvement:** The process of making persuasive and constructive contributions, providing information and practices to the further shaping of the processes and developments within a field of study or work.

**Knowledge:** What a learner knows, understands and can demonstrate in terms of the body of facts, principles, theories and practices related to broad general or specialized fields of study or work.

**Learning domains:** Categories of learning. Several domain models are in use. The beta Credentials Framework is organized into two domains (knowledge and skills) and three sub-domains of skills (specialized, personal and social).

**Learning outcomes:** Statements that describe what learners should know, understand and be able and ready to do on completion of a learning process, whether formal or informal, classroom-based or workplace-based.

**Level descriptors:** A summarization of the characteristics of competencies at a certain level in the beta Credentials Framework for the two learning domains (knowledge and skills) and the three sub-domains of skills (specialized, personal and social).

**Levels:** A categorization within the beta Credentials Framework of competencies and learning outcomes based on the complexity, depth, and breadth of knowledge and skills.

**Level requirements:** Descriptors that characterize the learning outcomes and competencies and permit a scoring judgment for learning outcomes/competencies represented by a credential(s).

**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/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.

**Personal skills:** Competencies required to act in an independent and responsible manner in various situations, to exercise judgment, demonstrate critical thinking and problem solving, reflect on one's own actions and on the actions of others, and to continue to develop his/her own competencies.

**Problem solving:** The ability to apply critical thinking skills and processes to define, analyze, synthesize, communicate and implement solutions to solve problems based on existing and missing information in varied contexts, both predictable and unpredictable, and to evaluate results and/or suggest alternatives, if required.

**Proficiency:** Specified demonstrations of knowledge, understanding and skill that satisfy the level of mastery sufficient to justify the award of an academic degree or other credential.

**Range:** Characterization of the scope of knowledge and skills (e.g., a broad or narrow range of knowledge and skills).

**Responsibility:** Competency to perform in a self-directed manner based on assigned authorities or personal decisions to assume accountability for results and integrity while considering the possible consequences.

**Selectivity:** The ability to judge and choose the appropriate methods, tools or measures to perform a task or process successfully at a specific level of requirement.

**Self-awareness and reflectiveness:** The ability to adapt and learn from change and experiences and critically assess one's own learning and the learning of others and what is required to continue to learn and to think and act critically.

**Skills:** What an individual can do in applying knowledge, completing tasks and solving problems (involving the use of logical, intuitive and creative thinking). Skills can be described in terms of types and complexity and include cognitive, technical, communication, interpersonal and practical skills (involving manual dexterity and the use of methods, materials, tools and instruments).

**Social skills:** An individual's ability to be aware of the behavior of others and of differing viewpoints, to communicate with others effectively, and to work effectively with people from diverse backgrounds and points of view.

**Specialized knowledge:** Command of the vocabularies, theories and skills of the field of study on which a student has focused.

**Specialized skills:** Skills that are occupational and discipline-specific.

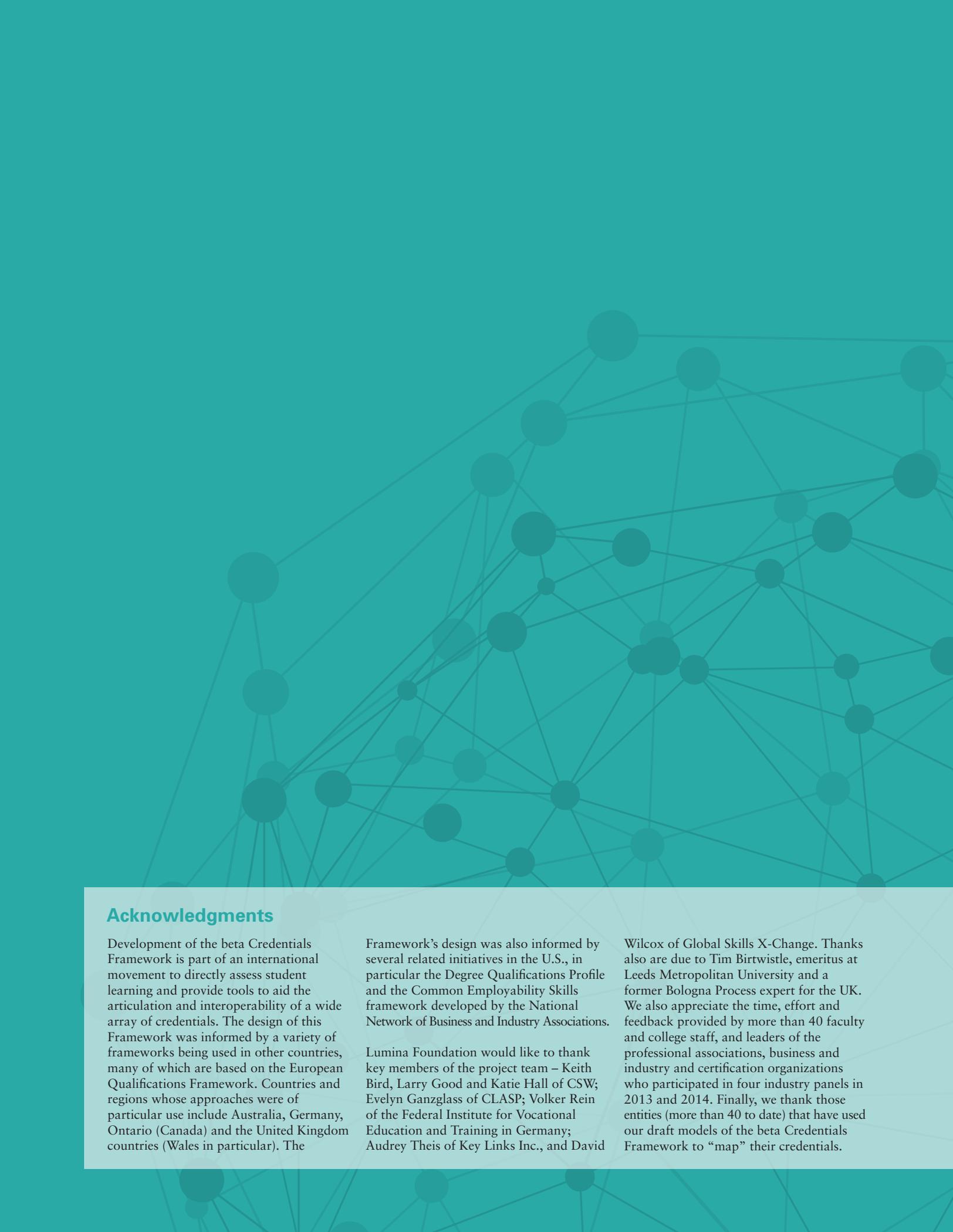
**Systems thinking:** Comprehensive understanding of a discipline or field of study as a whole and the application of integrative applied skills to assess complex interrelationships and correlations in order to develop new ideas or knowledge.

**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.

**Teamwork and leadership:** The competency to lead and work with others effectively, exhibiting professional behaviors and taking responsibility for decision-making in predictable or unpredictable work or study contexts. This can also involve managing the professional and leadership development of individuals and groups and reviewing the performance of teams.

**Tuning:** A faculty-led, discipline-by-discipline (including occupational and technical programs) process to determine what students should learn and be able to do at applicable stages of the disciplinary curriculum. Originally a European initiative associated with the Bologna Process, Tuning projects are moving forward in the U.S. and internationally.

**Validation:** Documentation that an individual is competent to perform the skills as reflected in a specific credential; this requires a validation of the credential and the awarding practices performed by a third party or industry. The vast majority of current credentials require no third-party or industry validation; rather, the granting educational institution or training provider issues them based on "seat time" or they employ instructor- or institution-validated competency attainment.



## Acknowledgments

Development of the beta Credentials Framework is part of an international movement to directly assess student learning and provide tools to aid the articulation and interoperability of a wide array of credentials. The design of this Framework was informed by a variety of frameworks being used in other countries, many of which are based on the European Qualifications Framework. Countries and regions whose approaches were of particular use include Australia, Germany, Ontario (Canada) and the United Kingdom countries (Wales in particular). The

Framework's design was also informed by several related initiatives in the U.S., in particular the Degree Qualifications Profile and the Common Employability Skills framework developed by the National Network of Business and Industry Associations.

Lumina Foundation would like to thank key members of the project team – Keith Bird, Larry Good and Katie Hall of CSW; Evelyn Ganzglass of CLASP; Volker Rein of the Federal Institute for Vocational Education and Training in Germany; Audrey Theis of Key Links Inc., and David

Wilcox of Global Skills X-Change. Thanks also are due to Tim Birtwistle, emeritus at Leeds Metropolitan University and a former Bologna Process expert for the UK. We also appreciate the time, effort and feedback provided by more than 40 faculty and college staff, and leaders of the professional associations, business and industry and certification organizations who participated in four industry panels in 2013 and 2014. Finally, we thank those entities (more than 40 to date) that have used our draft models of the beta Credentials Framework to “map” their credentials.

