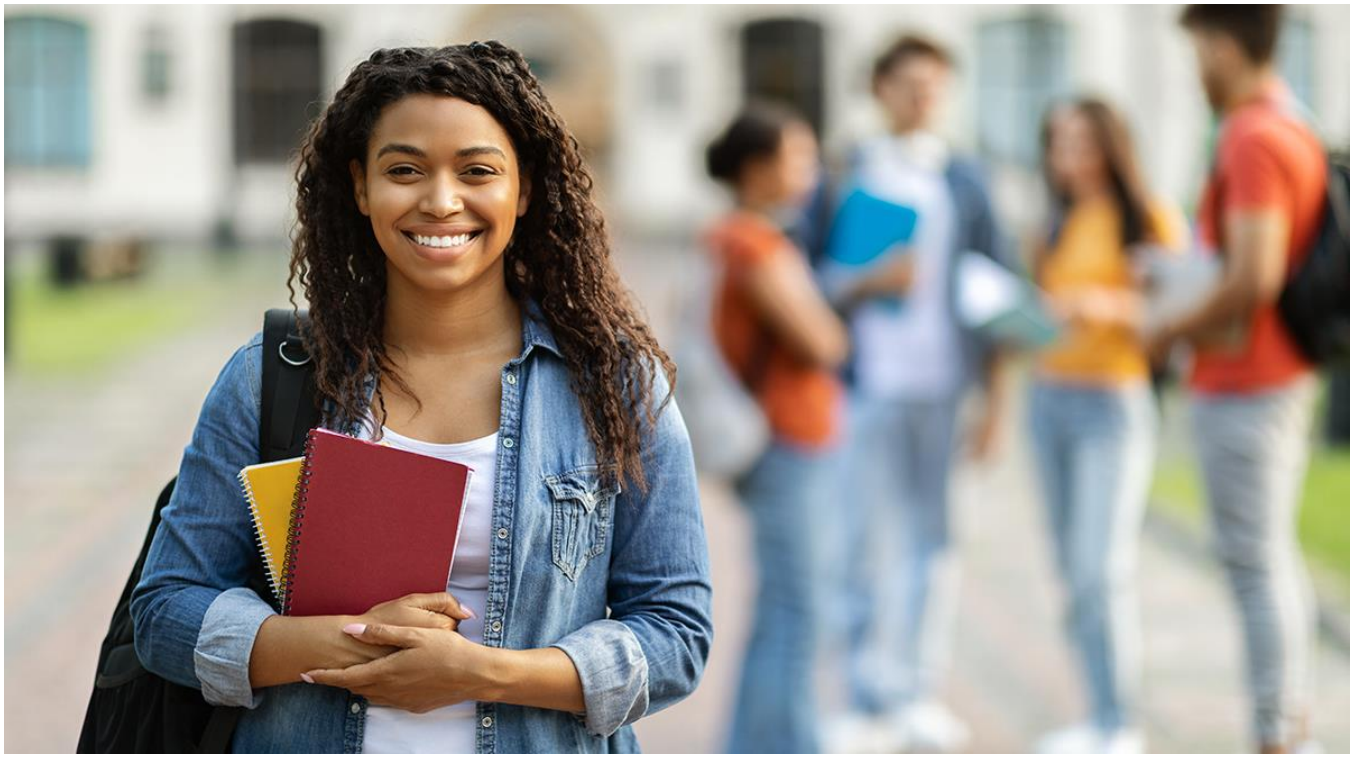
COLORADO
Department of Higher Education

Framework for Credential Evaluation and Classification



2025

The Colorado Department of Higher Education
Report to the education committees of the House of Representatives and the Senate of the Colorado General Assembly

Statute: C.R.S. 23-5-145.8

The Colorado Department of Higher Education (DHE), under its own authority and through the Colorado Commission on Higher Education (CCHE), oversees and coordinates policy for 31 public institutions of higher education (including community colleges, independent local district colleges and local area technical colleges) and authorizes and regulates private colleges, universities and occupational schools.

Mission – We support students, advocate and develop policies to maximize higher education opportunities for all.

Vision – All Coloradans will have an education beyond high school to pursue their dreams and improve our communities.

COLORADO
Department of Higher Education

Prepared and submitted by the Colorado Department of Higher Education
under the Executive Leadership of Dr. Angie Paccione
Pursuant to the statutory authority of C.R.S. 23-5-145.8

July 2025

1600 Broadway, Suite 2200, Denver, CO 80202

For more information contact:

Peter Fritz
Director of Student Transitions and Degree Completion Initiatives
CDHE@dhe.state.co.us

COLORADO
Department of Higher Education

1600 Broadway, Suite 2200
Denver, CO 80202

I am pleased to present this report on Colorado's work to establish a framework for evaluating and classifying non-degree credentials within our state's education and workforce systems. This initiative represents a significant milestone in building transparent, competency-based pathways that meet the evolving needs of Colorado's learners and employers.

Through Senate Bill 24-143, the Colorado General Assembly tasked the Department of Higher Education with developing a framework that aligns non-degree credentials with international standards, specifically the International Standard Classification of Education (ISCED). This builds upon our previous work, as outlined in Senate Bill 22-192, which established stackable credential pathways and Colorado's Quality and In-Demand Non-Degree Credentials Framework.

This report documents our collaborative effort to evaluate non-degree credentials across five high-demand industries: healthcare, behavioral health, early childhood education, cybersecurity, and software development. By applying ISCED standards alongside the National Qualifications Framework (NQF) and O*NET classifications, we have created a multi-dimensional evaluation approach that provides both international comparability and practical applicability for Colorado's workforce needs.

Our stakeholder engagement revealed both the promise and complexity of this work. Employers struggle with quality assurance when evaluating diverse credential offerings, while educational institutions navigate the shift toward industry-driven program development. These challenges underscore the importance of establishing clear, transparent frameworks.

This framework is intentionally designed as a prototype. A foundation upon which our partner agencies will build, refine and evolve as we learn from implementation and gather additional feedback from industry and educational partners.

Our vision is to create a system where learners can confidently pursue alternative credential pathways, employers can efficiently evaluate candidate qualifications, and Colorado maintains its competitive edge in developing a skilled workforce.

I extend my gratitude to all stakeholders who contributed their expertise to this project. Together, we are building pathways to prosperity that honor both traditional education and the diverse ways Coloradans acquire the skills our economy demands.

Sincerely,

Angie Paccione

Dr. Angie Paccione
Executive Director of the Colorado
Department of Higher Education

Executive Summary

Legislative Background and Purpose

Colorado Revised Statute §23-5-145.8 (Credential Quality Apprenticeship Classification) mandates the development of a comprehensive framework for evaluating and classifying non-degree credentials within Colorado's education and workforce systems. This legislation builds upon the foundation established by Senate Bill 22-192, which created 11 stackable credential pathways across five high-demand industries and developed Colorado's Quality and In-Demand Non-Degree Credentials Framework.

The legislation recognizes that Colorado's economic strength depends on a skilled workforce, with a significant percentage of top jobs requiring postsecondary education, including non-degree credentials such as industry certifications and apprenticeships. While the Quality and In-demand Non-degree Credentials Framework serves as the primary tool for evaluating credentials, there was no systematic process for ensuring compatibility and recognition throughout education, training, and workforce systems that focuses on skills and competencies rather than solely classroom-based learning.

Project Overview and Methodology

The Colorado Department of Higher Education, in coordination with state agencies and stakeholder partners, developed Colorado's first systematic approach to ensuring compatibility and recognition of alternative credentials throughout education, training, and workforce systems. This initiative represents a pioneering effort to align non-degree credentials with international standards, specifically the International Standard Classification of Education (ISCED).

During the comprehensive credential analysis, 69 non-degree credentials were initially evaluated across five critical industries:

- **Behavioral Health** (Social Work, Addiction Counseling)
- **Cybersecurity** (Information Security Analyst via Industry Certifications and Work Experience, Information Security Analyst via Cybersecurity Apprenticeship)
- **Software Development** (Full-Stack Developer, Military to Front-End Developer, DevOps)
- **Education** (Early Childhood Education to Degree + Licensure, Early Childhood Education Apprenticeship to Degree)
- **Healthcare** (Emergency Medical Services, Nursing, Medical Technician)

These industries were selected based on the 11 stackable credential pathways created in Senate Bill 22-192, per the requirements of C.R.S §23-5-145.8. Following a rigorous pre-screening process, 48 credentials were included in the final classification schema.

Multi-Dimensional Classification Framework

The design team, comprised of representatives from the Department, the Colorado Workforce Development Council, the Office of the Future of Work and industry content experts, developed an innovative multi-dimensional evaluation approach utilizing three complementary international and national standards. Each dimension is described at a high level below, with a more comprehensive overview in the body of this report:

1. **International Standard Classification of Education** (ISCED): Provides global comparability and education level equivalency, enabling international recognition of Colorado credentials. ISCED (International Standard Classification of Education) is the United Nations Educational, Scientific and Cultural Organization’s (UNESCO's) framework for organizing education programs and

qualifications into comparable categories worldwide. It provides a systematic way to classify and compare educational systems across different countries, and are described below:

- **ISCED 0 - Early Childhood Education** Programs designed for children typically under 6 years old, focusing on socio-emotional development and introducing basic learning skills.
- **ISCED 1 - Primary Education** Elementary education usually lasting 4-7 years, providing fundamental skills in reading, writing, and mathematics. Typically begins around age 5-7.
- **ISCED 2 - Lower Secondary Education** Builds on primary education with more subject-specialized instruction. Usually lasts 2-5 years and completes basic education, often ending around age 15-16.
- **ISCED 3 - Upper Secondary Education** Prepares students for higher education or direct entry to the labor market. Often includes academic or vocational tracks, typically completing around age 17-19.
- **ISCED 4 - Postsecondary Non-Tertiary Education** Programs that bridge secondary and tertiary education, such as trade certificates or preparation courses for higher education.
- **ISCED 5 - Short-Cycle Tertiary Education** Practical, technical, or occupationally-specific programs, typically 2-3 years. Includes associate degrees and advanced technical diplomas.
- **ISCED 6 - Bachelor's Level** First university degrees, typically 3-4 years of full-time study, providing broad knowledge in a field of study.
- **ISCED 7 - Master's Level** Advanced academic or professional programs, usually 1-2 years after bachelor's degree, offering specialized knowledge.
- **ISCED 8 - Doctoral Level** Highest level of formal education, leading to advanced research qualifications like PhDs, typically requiring 3+ years of intensive research.

2. **National Qualifications Framework (NQF)**: Offers competency-based assessment of skills, autonomy, and responsibility levels, particularly valuable for non-formal learning context. Typical representation of NQF categories are below:

   - **Level 1 -** Basic general knowledge and simple task skills; Direct supervision required in structured environments.
   - **Level 2 -** Factual knowledge in specific field; Routine problem-solving with simple tools; Supervised work with limited autonomy.
   - **Level 3 -** Understanding of facts, principles, and processes; Task completion and basic problem-solving skills; Personal responsibility for own work and adaptability.
   - **Level 4 -** Factual and theoretical knowledge in broad contexts; Solution generation for specific field problems; Self-management and supervision of others for routine work.
   - **Level 5 -** Comprehensive specialized knowledge with awareness of boundaries of knowledge in the field; Creative problem-solving for abstract challenges; Management of others in unpredictable environments.
   - **Level 6 -** Advanced knowledge with critical understanding of theories; Mastery and innovation in complex problem-solving; Management of technical projects and professional development.
   - **Level 7 -** Highly specialized and cutting-edge knowledge across fields; Research and innovation skills for new knowledge development; Strategic management of complex, unpredictable contexts.
   - **Level 8 -** Most advanced knowledge at the forefront of a field; Awareness of intersections with other fields; Synthesis and evaluation skills for critical problem-solving; Substantial authority, innovation, and commitment to advancing knowledge.

3. **Occupational Information Network (O*NET):** Ensures workforce alignment and occupational classification using widely recognized U.S. standards. The content of the O*NET framework is organized around primary categories:
    - **Worker characteristics** (abilities, occupational interests, work values, work styles)
    - **Worker requirements** (skills, knowledge, education)
    - **Experience requirements** (training, experience, licensing)
    - **Occupational requirements** (generalized work activities, work context, organizational context)
    - **Labor market information** (employment outlook, wages)
    - **Occupation-specific information** (tasks, tools, technology)

Comprehensive Evaluation Process

The design team developed a classification process that included multiple validation mechanisms:

- **Pre-screening evaluation** using a comprehensive rubric assessing credential type, issuer, regulatory status, and transferability.
- **Multi-framework analysis** applying ISCED, NQF, and O*NET standards simultaneously
- **Stakeholder engagement** with employers, educational institutions, and industry associations across all five sectors.
- **Quality assurance alignment** with Colorado's existing Quality Non-Degree Credentials Framework.
- **Expanded evaluation process** for complex credentials requiring additional research and analysis.

Industry-Specific Findings and Insights

Healthcare

The healthcare sector had the most straightforward classification process, with 90% of credentials mapping to ISCED Level 4 (postsecondary non-tertiary education) and 77% aligning with NQF Level 3 (specialist knowledge requiring some autonomy). This reflects the highly structured, regulated nature of healthcare credentials driven by licensing requirements and Medicaid reimbursement rules. The sector's clear regulatory and licensing framework facilitated straightforward ISCED and O*NET coding, though NQF application proved more complex due to overlapping responsibilities across nursing and medical assistant positions.

Cybersecurity and Software Development

These technology sectors demonstrate strong standardization through industry-recognized certifications from trusted organizations like Microsoft, Amazon Web Services, Google, and CompTIA. Credentials predominantly fall within ISCED Level 4, representing industry-standard certifications that provide immediate workforce applicability without requiring formal degrees. However, employers emphasize that credentials alone do not qualify candidates for employment, relying instead on interviews assessing work experience and problem-solving skills through coding challenges.

Behavioral Health

This sector presents a complex landscape with credentials spanning ISCED Levels 3-5, reflecting diverse pathways from entry-level positions to advanced practice roles. Like healthcare, the field operates within a regulatory framework driven by reimbursement mechanisms such as Medicaid, making it difficult to create equivalent educational opportunities through non-formal structures. The Qualified Behavioral Health Associate (QBHA) credential exemplifies innovative competency-based approaches approved for Medicaid inclusion.

Early Childhood Education

The early childhood education field faces fundamental credentialing challenges where high staffing needs clash with strict qualification requirements, compounded by low wages preventing advancement. Colorado's Department of Early Childhood has responded by creating the voluntary Early Childhood Professional Credential (ECPC) 3.0 system, which awards points across formal education, professional development, experience, and demonstrated competencies. This system promotes skills-based hiring while recognizing diverse learning methods.

Stakeholder Engagement Insights

Industry Perspectives

Comprehensive interviews with employers across all five sectors revealed consistent challenges in credential evaluation and talent pipeline development:

- **Quality Assurance Concerns**: Employers struggle to distinguish between high-quality and low-value credentials, often relying on reputation and word-of-mouth recommendations
- **Administrative Complexity**: The credential vetting process requires extensive detective work across multiple systems with varying standards
- **Skills-Based Hiring Evolution**: Growing interest exists in skills-based hiring, but implementation varies dramatically by industry and company size
- **Talent Pipeline Challenges**: Educational requirements often don't match compensation levels, particularly in early childhood education and healthcare

Higher Education Perspectives

Institutional interviews revealed fundamental shifts in program development:

- **Industry-Driven Development**: Transition from faculty-driven to industry-driven credential development based on workforce data and advisory council feedback
- **Stackability as Design Principle**: Institutions increasingly design smaller programs preventing educational dead ends while providing immediate labor market value
- **Data Collection Challenges**: Difficulty isolating the impact of credentials embedded within degree programs
- **Resource Allocation Tensions**: Institutions cannot serve all industries simultaneously, forcing strategic annual focus decisions

Key Challenges and Observations

The comprehensive analysis identified several critical challenges that inform future implementation:

1. **Regulatory Complexity**: Highly regulated industries (healthcare, behavioral health, education) present additional classification considerations due to licensing and education requirements
2. **Standalone Value Variations**: Some micro-credentials provide workplace currency only when bundled, particularly in behavioral health
3. **Skills-Based Assessment Difficulties**: Traditional credential-based systems challenge the evaluation of competency-based learning, such as apprenticeships
4. **Transferability Inconsistencies**: Credit recognition varies significantly by industry and institutional agreements
5. **Quality Assurance Gaps**: Need for systematic approaches to distinguish high-quality from low-value credentials

Economic and Workforce Impact Potential

This foundational work establishes Colorado's commitment to building transparent, competency-based pathways that bridge traditional education and alternative credential systems. By providing internationally comparable credential classifications, the framework has significant potential to:

- Enhance Employer Decision-Making: Provide clear understanding of candidate qualifications across diverse credential types
- Improve Learner Mobility: Enable seamless transitions across education and training systems
- Support High-Demand Industries: Strengthen workforce development in critical sectors experiencing skills gaps
- Facilitate International Recognition: Position Colorado workers for global opportunities through ISCED alignment
- Reduce Administrative Burden: Streamline credential evaluation processes for employers and educational institutions

Strategic Recommendations

Based on the development of the classification prototype, comprehensive analysis of credentials in the required industries, and stakeholder feedback, five strategic recommendations emerge to consider as this work moves forward:

1. **Framework Refinement and Transferability**: Review and refine the prototype classification framework to ensure transferability, applicability, and relevance to other state agencies and industry partners, potentially developing a unified qualifications framework incorporating both ISCED and NQF criteria

2. **Systematic Process Development**: Establish automated or semi-automated processes for ongoing classification of new credentials and apprenticeship programs, potentially leveraging artificial intelligence and partnerships with organizations like Credential Engine

3. **Enhanced Stakeholder Engagement**: Expand employer and higher education engagement to ensure classification relevance and industry recognition through continuous feedback mechanisms

4. **Cross-Agency Coordination**: Create and expand coordination mechanisms ensuring consistent implementation across the Office of the Future of Work, State Apprenticeship Agency, Colorado Workforce Development Council, and Colorado Department of Education

5. **Quality Assurance Integration**: Develop comprehensive quality assurance processes for credentials in partnership with industry and higher education stakeholders

Implementation Timeline and Next Steps

The framework expands to partner agencies beginning January 1, 2026, with specific milestones:

- **July 31, 2025**: Completion of initial ISCED equivalency recommendations

- **January 1, 2026:** and annually thereafter: CDHE collaboration with partner agencies to evaluate state-recognized non-degree credentials

- **January 1, 2027**: Office of the Future of Work alignment of all pre-existing apprenticeship programs

- **Ongoing**: Annual review and publication of quality credential programs; CDHE collaboration with partner agencies to ensure the effective integration of the Quality Nondegree Credentials Framework within the state's education and workforce systems

Conclusion

This initiative represents Colorado's pioneering effort to create systematic, internationally recognized standards for non-degree credential evaluation and classification. While designed as a prototype requiring refinement through implementation experience, the framework establishes a foundation for transparent, competency-based pathways that honor both traditional education and diverse skill acquisition methods. Success will depend on continued stakeholder engagement, iterative refinement, and commitment to maintaining alignment with evolving industry needs and international standards.

The framework's ultimate vision is creating a system where learners can confidently pursue alternative credential pathways, employers can efficiently evaluate candidate qualifications, and Colorado maintains its competitive edge in developing a skilled workforce prepared for the 21st century economy.

Table of Contents

Executive Summary 3
Legislative Background and Purpose 4
Project Overview and Methodology 4
Multi-Dimensional Classification Framework 5
Comprehensive Evaluation Process 8
Industry-Specific Findings and Insights 9
Stakeholder Engagement Insights 10
Key Challenges and Observations 11
Economic and Workforce Impact Potential 12
Strategic Recommendations 12
Implementation Timeline and Next Steps 13
Conclusion 14
Table of Contents 15
Section 1 - Introduction 17
Report Format 17
Overview of Legislative Requirements 18
Overview of Opportunities for Credential Attainment 21
Section 2 - Methodology 24
International Standard Classification of Education (ISCED) 24
The National Qualifications Framework (NQF) 28
Occupational Information Network (O*NET) 32
Classification Design Process 33
Stakeholder Engagement 41
Summary 47
Section 3 - Analysis 48
Final Credential Classification and Observations 48
Section 4 – Recommendations and Next Steps 55
Next Steps 57
Acknowledgments 57
SECTION 5 - Appendices 58
Appendix A - Expanded Evaluation Process: Credential Summary and Expanded Rubric 58
Appendix B - Interview Guides 69
Appendix C - Pre-Screening Evaluation Rubric 75
Appendix D - Final Classification Rubric 77

Table of Figures

Figure 1: Germany ISCED Map 26

Figure 2: United States ISCED Map 27

Figure 3: Example Credential Summary: Early Childhood Education Teaching Assistant 61

Figure 4: Example Expanded Rubric for ISCED and Qualifications Framework Level Determination: Early Childhood Teaching Assistant – ISCED Determination 64

Figure 5: Example Expanded Rubric for ISCED and Qualifications Framework Level Determination: Early Childhood Teaching Assistant – NQF Knowledge Components 65

Figure 6: Example Expanded Rubric for ISCED and Qualifications Framework Level Determination: Early Childhood Teaching Assistant – NQF Skills Components 66

Figure 7: Example Expanded Rubric for ISCED and Qualifications Framework Level Determination: Early Childhood Teaching Assistant – NQF Autonomy and Responsibility Components..... 67

Figure 8: Example Expanded Rubric for ISCED and Qualifications Framework Level Determination: Early Childhood Teaching Assistant – Rubric Score Sheet 68

Table of Tables

Table 1: International Standard Classification of Education (ISCED) Levels 25

Table 2: National Qualification Framework (NQF) Levels 30

Table 3: Healthcare Credential Classifications 49

Table 4: Behavioral Health Credential Classifications 50

Table 5: Cybersecurity Credential Classifications .. 51

Table 6: Software Development Credential Classifications 52

Table 7: Education (Early Childhood Education) Credential Classifications 53

Section 1 - Introduction

Report Format

This report is organized into 5 sections. Section 1 contains an overview of "Credential Quality Apprenticeship Classification" (C.R.S. §23-5-145.8, Senate Bill 24-143) and its legislative requirements. It also contains a summary of "Opportunities for Credential Attainment" (Senate Bill 22-192, C.R.S. §23-5-145.6), covering the major findings of the legislative reports and process for development of the Stackable Credential framework and the resulting eleven pathways that were developed. Additionally, this section provides an overview of the development of the Quality and In-demand Non-degree Credentials framework released by the Colorado Workforce Development Council.

Section 2 provides an in-depth overview of systems for classifying credentials and educational systems relevant to this project, including The International Standards Classification of Education (ISCED), the National Qualifications Framework (NQF) and the Occupational Information Network (O*NET). This section covers the historical development and current uses of these classification systems in both the United States and in other countries. Section 2 also outlines the process utilized to design a classification process for non-degree credentials and non-formal learning, such as apprenticeships, identified within each of the stackable credential pathways. Additionally, this section describes the historical development of the International Standards of Classification (ISCED), its historical development and uses in other countries outside of the United States. This section also provides an overview of two other classification models utilized in the United States (O*Net) and an additional model used in other countries (The National Qualifications Framework- NQF, also referred to as the European Qualifications Framework- EQF). This section also provides a summary of feedback from employer and institutional stakeholders, and observations on the process by industry cluster/stackable pathway.

Section 3 provides the final credential classifications and includes references to both the NQF and O*Net as supplementary information for future use. Section 4 provides recommendations and next steps for further refinement of design and classification as this project moves forward to other state agency partners, including the Office of the Future of Work, the State Apprenticeship Agency and the Colorado Department of Education. Finally, Section 5 contains related appendices and supplementary information related to this project.

Overview of Legislative Requirements

"Credential Quality Apprenticeship Classification" (C.R.S. §23-5-145.81; Senate Bill 24-143) creates provisions that enhance Colorado's workforce by incorporating a framework for evaluating and classifying non-degree credentials (a certificate, license, microcredential or other form of recognition that signifies a specific skill or competency, but does not lead to a traditional academic degree) into the state's education and workforce systems. Key provisions of this act include the alignment of non-degree credentials within Stackable Credential pathways and apprenticeship programs developed under C.R.S. §23-5-145.62 (Senate Bill 22-192) with the International Standard Classification of Education (ISCED) standards. The development of a framework to evaluate and classify non-degree credentials through this act begins with those under the auspices of the Colorado Department of Higher Education (CDHE), which will move to other state agencies on completion of this initial phase. Specific provisions of this bill include:

On or before July 31, 2025:

- The Department of Higher Education, in coordination with other state agencies, and with input from educational institutions, international organizations, industry associations and others, will make recommendations about the adoption of the of the international standard classification of education (ISCED) as the state's standard framework for classifying non degree credentials and ISCED's wider application in the state's education and workforce systems.

[1] Colorado Revised Statutes (2025). *Credential Quality Standards*. C.R.S. §23-5-145.8.
[2] Colorado Revised Statutes (2025). *Opportunities for credential attainment*. C.R.S. §23-5-145.6

- The development of a process for assigning ISCED equivalency levels to non-degree credentials included in stackable credential pathways and apprenticeship programs. The act requires the department to report its findings and recommendations on or before July 31, 2025.

- Assignment of appropriate ISCED equivalency levels to the Stackable Credential pathways created via C.R.S. §23-5-145.6.

Beginning January 1, 2026

- The Office of the Future of Work will coordinate with other agencies to determine ISCED equivalency levels for each apprenticeship program registered on and after July 31, 2025.

- Require posting of determined ISCED level alongside apprenticeship program on all issued apprenticeship certificates of completion and in all public listings, including the Eligible Training Provider List and the Apprenticeship Resource Directory.

- CDHE, in collaboration with the Colorado Department of Education (CDE), the Colorado Department of Labor and Employment (CDLE), and the Colorado Office of Economic Development and International Trade (OEDIT), will supply the Colorado Workforce Development Council (CWDC) with a list of non-degree credential programs that meet the quality standards of the Quality and In-Demand Non-Degree Credentials Framework. Programs to be evaluated by January 1, 2026 include those identified in the Career Development Success Program (or its successor) and those within Colorado's existing Stackable Credential Pathways.

On or before January 1, 2027

- The Office of the Future of Work will align equivalency levels for each apprenticeship program registered before July 31, 2025, and publish levels in all public listings, including the Eligible Training Provider Lists and the Apprenticeship Resource Directory.

Ongoing

- By January 1 each year, CDHE, in collaboration with CDE, and OEDIT will supply the CWDC with a list of non-degree credential programs that meet the quality standards of the Quality Non-Degree Credentials Framework for inclusion in the Colorado Talent Pipeline Report and in a credential registry endorsed by the state.

- The Colorado Workforce Development Council, in collaboration with CDHE, CDE, CDLE, CCCS Career and Technical Division, and OEDIT, will annually review and publish a list of industry-credential programs and workplace training programs within the Career Development Success Program that meet the quality standards of the Quality Non-Degree Credentials Framework.

- CDHE, in collaboration with the CWDC, CDE, CDLE, OEDIT, and the Colorado Community College System (CCCS) will ensure the effective integration of the Quality Non-degree Credentials Framework within the state's education and workforce systems.

Within the context of this project, the legislation recognizes that Colorado's economic strength depends on educational opportunities and a skilled workforce. A significant percentage of top jobs in the state require postsecondary education, including non-degree credentials such as industry certifications and apprenticeships. While progress has been made in leveraging the Quality and In-demand Non-degree Credentials Framework,[3] which is the primary tool for evaluating non-degree credentials, including certifications, occupational licenses, apprenticeship certificates, non-credit certificates, micro-credentials, and sub-baccalaureate for-credit certificates, there is no systematic process for ensuring compatibility and recognition of credentials throughout education, training, and workforce systems, with a focus on skills and competencies rather than solely on learning that takes place in the classroom. Using an international standard, such as ISCED, creates a mechanism that can bridge the gap between education-focused and non-degree credentials that is transparent for both l/earners and employers.

---

[3] Colorado Workforce Development Council (2023). *Quality and in-demand non-degree credentials framework*.https://drive.google.com/file/d/1otXw2TYw4qz3SDfJhEx5dR_M7P6YcN1v/view

Overview of Opportunities for Credential Attainment

"Opportunities for Credential Attainment" (Senate Bill 22-192; C.R.S. §23-5-145.6) required that the Department build 10 stackable credential pathways across five high-value, in-demand industries by January 1, 2025. The legislation also required the Department to create a non-degree credential evaluation framework by which to determine the quality of non-degree credentials, particularly those built into the stackable credential pathways.[4]

Leveraging data available in Colorado's Talent Pipeline Report,[5] the Department worked with industry and academic partners, state agency representatives, and intermediary organizations to develop 12 stackable credential pathways that include non-degree certifications and academic credentials in the following industries:

- **Behavioral Health** (Social Work, Addiction Counseling)
- **Cybersecurity** (Information Security Analyst via Industry Certifications and Work Experience, Information Security Analyst via Cybersecurity Apprenticeship)
- **Software Development** (Full-Stack Developer, Military to Front-End Developer, DevOps)
- **Education** (Early Childhood Education to Degree + Licensure, Early Childhood Education Apprenticeship to Degree)
- **Healthcare** (Emergency Medical Services, Nursing, Medical Technician)

Each stackable credential pathway was designed to allow learners and earners to have flexibility in the accumulation of skills and credentials over time, which facilitates career advancement and academic degree progression. During the development process, team members identified a number of opportunities and challenges within each pathway, including persistent workforce shortages, barriers

[4] Colorado Department of Higher Education (2024). *Stackable credential pathways: Report on opportunities for credential attainment (SB 22-192).* https://highered.colorado.gov/Publications/Reports/Legislative/General/2024/2024_Stackable_Credentials_Report_FINAL.pdf
[5] Colorado Workforce Development Council (2024). *Colorado Talent Pipeline Report.* https://cwdc.colorado.gov/resources/colorado-talent-pipeline-report

to entry exacerbated by academic credentials or regulatory requirements, and opportunities to align educational programs directly with industry requirements and promotion of career progression and enhanced access to training.

Quality & In-Demand Non-Degree Credentials Framework

In addition to the creation of stackable credential pathways, the development team was required to build and refine both a definition of a "quality non-degree credential" as well as a rubric by which to evaluate whether a particular non-degree credential meets the Colorado definition of a quality credential. In October 2023, the Colorado Workforce Development Council published the final version *Quality and In-demand Non-degree Credentials* framework, which provides both the definition of a quality non-degree credential as well as a rubric to determine if a credential meets the quality definition. To determine if a credential meets quality standards and should be recognized as a quality and in-demand nondegree credential, the credential must demonstrate each of the four signals of quality as outlined in the rubric below:

- **Demand**: The credential aligns with industry and economic demand, is recognized as a top job or critical occupation in Colorado's Talent Pipeline Report or is defined as a regional need or emerging credential by the local workforce agency.

- **Evidence of Skills:** The credential provides transparent evidence of the skills and competencies learned when earning the credential.

- **Employment Outcomes**: The credential has evidence of substantial employment outcomes. There is proof that having the credential either directly leads to jobs paying a living wage in a growing occupation or develops the essential skills and competencies needed for those jobs. In cases where the credential does not lead to a living wage job, it can be stacked with other credentials and used to earn a living wage, and/or it leads to a critical occupation necessary for the well-being of the community.

- **Stackability**: The credential must be stackable. The credential exists as part of an aligned sequence of credentials allowing for skill development, career progression, and increased earnings over time.

OR

The credential must meet one of the following criteria:

- The credential is required by law (i.e., Department of Regulatory Agencies or other
- regulatory/certifying agency) or is a prerequisite to a credential required by law.
- The credential is part of (or a prerequisite to) a Registered Apprenticeship Program.
- The credential leads to a critical occupation identified by CWDC's Career Pathways Team, as evidenced by being directly related to an occupation or pathway in Careers in Colorado in My Colorado Journey.[6]

The Quality Degree Credential definition and rubrics are currently being utilized across state agencies to evaluate credentials in both the Career Development Incentive Program List[7] for K12 (secondary) district reimbursement and credentials on the Eligible Training Provider List.[8]

[6] Colorado Workforce Development Council (2023). *Quality and in-demand non-degree credentials framework*.https://drive.google.com/file/d/1otXw2TYw4qz3SDfJhEx5dR_M7P6YcN1v/view
[7] Colorado Department of Education (2025). *Colorado career development and industry credentials communications toolkit*. https://www.cde.state.co.us/communications/tools-top10industrycredentials
[8] Colorado Department of Labor and Employment (n.d.) Educational Programs and Training. https://cdle.colorado.gov/jobs-training/training/educational-programs-training

Section 2 - Methodology

The design team, comprised of representatives from the Department, the Office of the Future of Work, the Colorado Workforce Development Council, industry experts and consultants, recognized that this project is Colorado's first attempt at a systemic classification of credentials from an international standards perspective. While assigning ISCED codes to non-degree credentials is the primary requirement of C.R.S. §23-5-145.8, there are other systems that are utilized internationally and in the U.S. context, which were included as part of the final classification of credentials. The addition of the National Quality Framework (NQF) is included to provide an alternative and needed examination of credentials that is more closely aligned with the evaluation of non-formal learning opportunities, and may be more applicable moving forward, particularly for work-based learning experiences such as apprenticeships. Additionally, leveraging the O*NET schema in the design process is included to align with longstanding systems that are widely recognized and utilized in the U.S. context. Overviews of ISCED, NQF and O*NET frameworks are provided in the following sections.

International Standard Classification of Education (ISCED)

The International Standard Classification of Education (ISCED)[9] is a framework that facilitates the comparison of education systems across countries. It provides standardized definitions and categories for different levels and types of education, ensuring global consistency in data collection and reporting.

ISCED Historical Development and Model

ISCED was initially developed in the 1970s with updates in 1997 and 2011. Currently, 201 countries throughout the world have approved ISCED mappings. The United Nations Educational, Scientific, and Cultural Organization's (UNESCO)[10] Institute for Statistics (UIS) collaborates with member states and data collection partners, such as the Organization for Economic Cooperation & Development (OECD)[11] and Eurostat,[12] to map education systems and collect data according to the ISCED classification.

[9] UNESCO Institute for Statistics (2012). *International Standard Classification of Education: ISCED 2011*. UNESCO. https://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf
[10] United Nations Educational, Scientific and Cultural Organization- UNESCO (n.d.) *Who we are.* https://www.unesco.org/en/brief
[11] Organisation for Economic Co-operation and Development- OECD (n.d.). *The OECD: Better policies for better lives.* https://www.oecd.org/en/about.html
[12] EUROSTAT: European Union (n.d.). About us. https://ec.europa.eu/eurostat/web/main/about-us

ISCED classifies education into nine levels, each corresponding to a stage in the educational process.[13] These levels range from early childhood education to advanced tertiary education, encompassing various types of programs and qualifications (Table 1):

Table 1: International Standard Classification of Education (ISCED) Levels

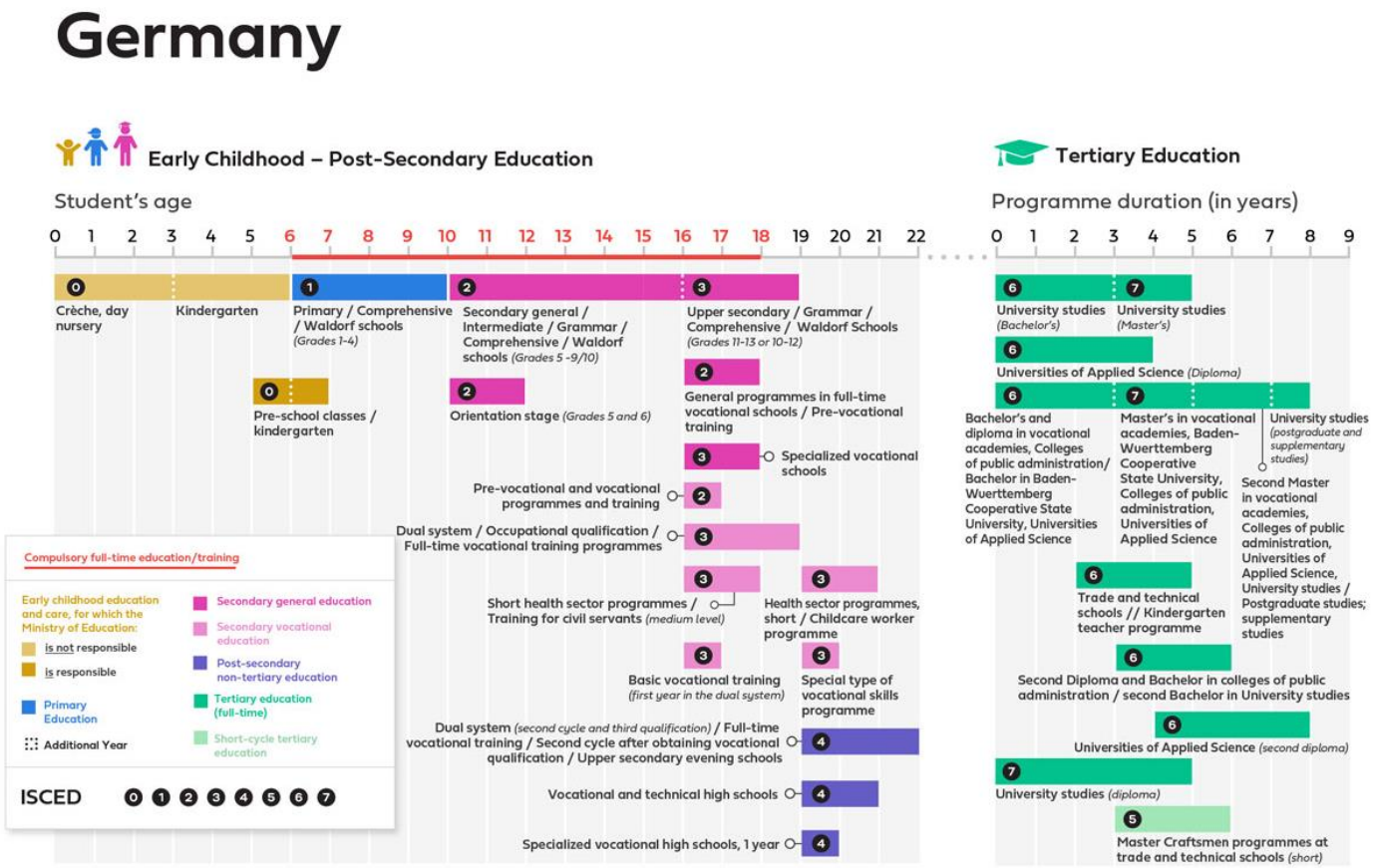
Level	Educational Classification	Description
0	Early Childhood Education	Education designed to support early development in preparation for participation in school and society. Programs designed for children below the age of 3.
0	Pre-Primary Education	Education designed to support early development in preparation in school and society. Programs designed for children from age 3 to the start of primary education.
1	Primary Education	Programs typically designed to provide students with fundamental skills in reading, writing and mathematics and to establish a solid foundation for learning
2	Lower Secondary Education	First stage of secondary education building on primary education, typically with a more subject-oriented curriculum.
3	Upper Secondary Education	Second final stage of secondary education preparing for tertiary education or providing skills relevant to employment. Usually with an increased range of subject options and streams.
4	Post-Secondary Non-Tertiary Education	Programs providing learning experiences that build on secondary education and prepare for labor market entry or tertiary education. The content is boarder than secondary but not as complex as tertiary education.
5	Short-Cycle Tertiary Education	Short first tertiary programs that are typically practically-based, occupationally-specific, and prepare for labor market entry. These programs may also provide a pathway to other tertiary programs.
6	Bachelor's or Equivalent	Programs designed to provide intermediate academic or professional knowledge, skills and competencies leading to a first tertiary degree or equivalent qualification.
7	Master's or Equivalent	Programs designed to provide advanced academic or professional knowledge, skills and competencies leading to a second tertiary degree or equivalent qualification.
8	Doctorate or Equivalent	Programs designed primarily to lead to an advanced research qualification, usually concluding with the submission and defense of a substantiative dissertation of publishable quality based on original research.

Source: Adapted from UNESCO Institute for Statistics (2012). International Standard Classification of Education- ISCED 2011.

[13] UNESCO Institute for Statistics. (2012). *International Standard Classification of Education: ISCED 2011*. UNESCO. https://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf

National ISCED mappings are published to provide transparency and support international comparability.[14] The current ISCED map of the education system for Germany[15] displayed in Figure 1 indicates multiple transition points and pathways between the final years of secondary education (level 3), postsecondary non-tertiary education programs (level 4), and tertiary education programs (levels 5 - 8). Options for both general education and vocational or technical education are offered within each of these levels.

Figure 1: Germany ISCED Map

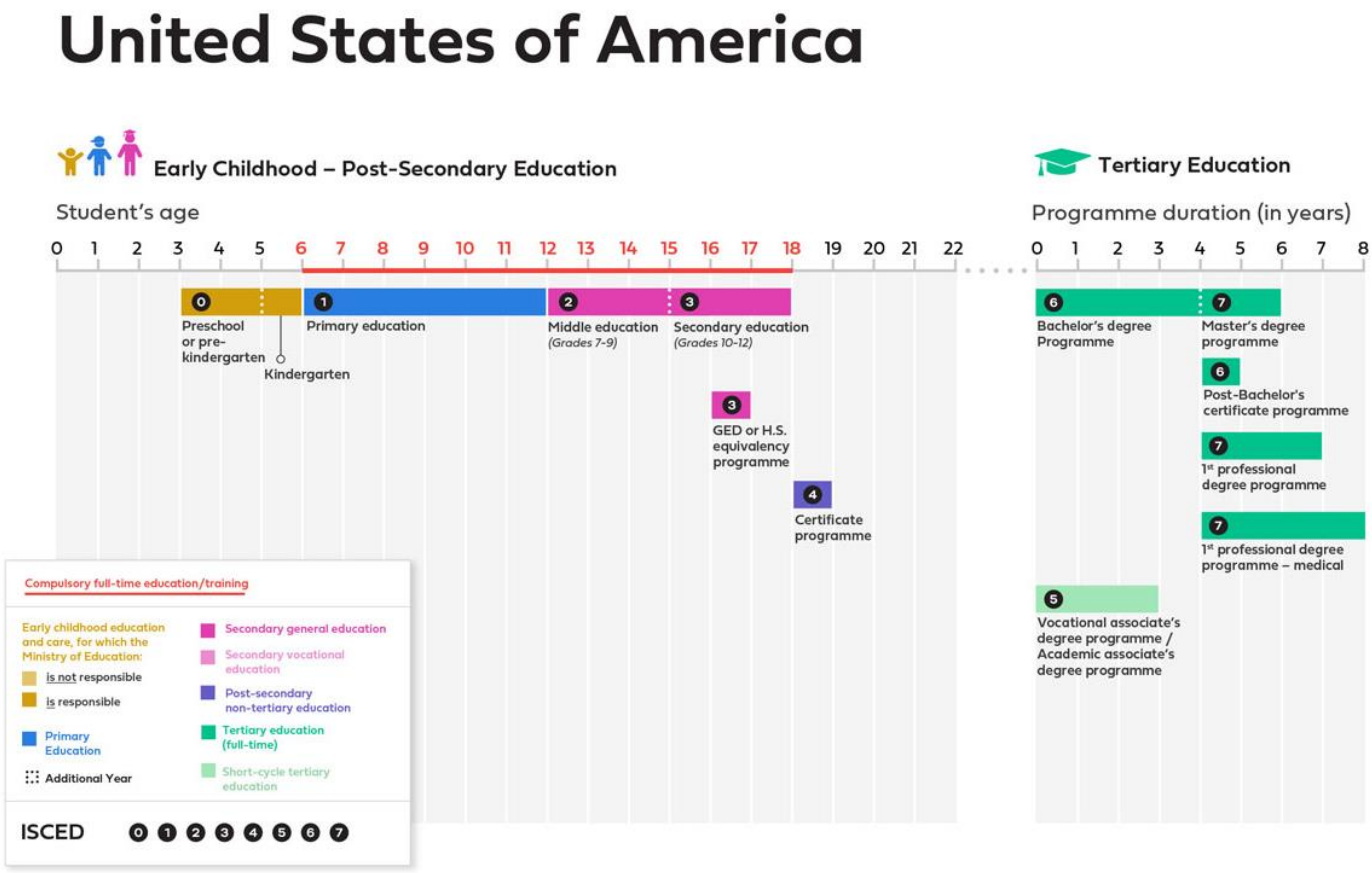


Source: UNESCO Institute for Statistics. (2021). *ISCED mappings: Germany*. https://isced.uis.unesco.org/wp-content/uploads/sites/15/uis_isced_uploads/099b5ceff48569e674514d347973ac0f.jpg

[14] UNESCO Institute for Statistics (2023). *Questions and answers about ISCED*. https://isced.uis.unesco.org/q-and-a/
[15] UNESCO Institute for Statistics. (2021). *ISCED mappings: Germany*. https://isced.uis.unesco.org/wp-content/uploads/sites/15/uis_isced_uploads/099b5ceff48569e674514d347973ac0f.jpg

In contrast, the ISCED mapping for the U.S. demonstrates a significantly simplified and more linear progression within and between educational levels, with little to no vocational options integrated into the formal education system. Visualizations of ISCED mappings for all participating countries can be found on the UNESCO website.[16]

Figure 2: United States ISCED Map



Source: UNESCO Institute for Statistics. (2021). *Country diagrams.* ***https://isced.uis.unesco.org/visualizations/***

[16] UNESCO Institute for Statistics. (2021). *Country diagrams.* https://isced.uis.unesco.org/visualizations/

Employers can leverage the use of ISCED to understand the educational backgrounds of job applicants (both in and outside of the country) and ensure that qualifications align with the requirements of positions, particularly across countries, making it easier for employers to compare the educational attainment of candidates from different backgrounds. For example, an employer might use ISCED to understand that an applicant with an equivalent Level 6 education or experience (a bachelor's degree or equivalent) from one country is equivalent to an applicant with a Level 6-equivalent degree or experience from another country. Similarly, they might use ISCED to determine that a job requiring a master's degree (ISCED Level 7) is suitable for an applicant with equivalent education and experience, regardless of the specific country where they received their education.

The National Qualifications Framework (NQF)

While ISCED allows general comparisons among educational levels, many countries are also leveraging the National Qualifications Framework (NQF), sometimes referred to as the European Qualifications Framework (EQF).[17] The National Qualifications Framework provides a system for classifying both educational levels *and* qualifications, is useful for both formal and non-formal learning, and validates learning achievements and integrations of skills and knowledge across sectors. ISCED and NQF are related but serve distinct purposes. ISCED is the global standard used for classification of *education* programs for international comparability, but is only an approximation of skills, knowledge, and competencies mastered at completion of a particular level.[18] NQF is a national framework that specifically categorizes *qualifications and learning outcomes* within a country's education and training system, irrespective of educational level or method of learning.

[17]All Swiss Federal Authorities: Federal Law (n.d.). *National qualifications framework for vocational education and training*. https://www.fedlex.admin.ch/eli/cc/2014/488/de#art_9
[18] ISCED 2011 UNESCO Manual

NQF Historical Development and Model

NQFs originated from a need to integrate and standardize different types of learning *and skills* development across various sectors of education and training. It aimed to improve transparency, comparability, and transferability of qualifications, particularly for lifelong learning and international recognition. Early NQFs were established in the late 1980s and early 1990s in countries such as Australia, England, Scotland, New Zealand, Ireland, and South Africa. These frameworks were influenced by the competence-based approach to vocational education and the growing emphasis on lifelong learning (SAQA;[19] CEDEFOP[20]). To date, more than 150 countries have adopted some form of NQF through various mechanisms in the European Union,[21] Bologna Process[22] and UNESCO.[23]While the U.S. does not currently have a recognized NQF, there have been efforts to create that system including the establishment of the United States Qualifications Framework in 2022.[24]

NQFs have three main purposes: *permeability*, *transparency*, and improving individuals' access to further education and training or employment through *portability*. Permeability refers to access to different levels and types of education and training from other programs, along with the opportunity to choose from multiple options, providing clear ladders to higher levels and bridges between vocation and academic pathways. Transparency refers to increased access to education and training, creating a structure that is less fragmented and more responsive to learners, and providing international comparability across education and training types. Finally, NQFs can enhance portability in various ways. Transparency and permeability both make portability possible, improving recognition among

---

[19] South African Qualifications Authority: SAQA. (n.d.). *A brief history*. https://www.saqa.org.za/about-saqa/a-brief-history/#:~:text=The%20NQF%20traces%20its%20origins,(COSATU)%20in%20July%201991

[20] European Centre for the Development of Vocational Training (2010). *The development of national qualifications frameworks in Europe*. https://www.cedefop.europa.eu/files/6108_en.pdf.

[21] Europass: European Union. (n.d.). *National Qualifications Framework (EQF).* https://europass.europa.eu/en/europass-digital-tools/european-qualifications-framework/national-qualifications-frameworks

[22] European Education Area: EU (n.d.). *The Bolonga Process and the European Higher Education Area*. https://education.ec.europa.eu/education-levels/higher-education/inclusive-and-connected-higher-education/bologna-process

[23] UNESCO (2022). *Latest global inventory of national and regional qualifications frameworks.* https://www.unesco.org/en/articles/latest-global-inventory-national-and-regional-qualifications-frameworks-published#:~:text=The%20second%20volume%20of%20the,been%20made%20in%20the%20field

[24] United States Qualifications Framework (2022). *Home*. https://usqf.org/

both education and training providers as it is focused on skills, knowledge, learning outcomes and levels of responsibility and autonomy.[25]

The NQF leverages ISCED as a reference point for classifying qualifications and determining levels of learning achievement. This helps ensure that qualifications are comparable both within a country and internationally. In many countries, the NQF will map its qualifications to the ISCED levels. For example, a diploma might be mapped to ISCED level 3 (upper secondary education), while a bachelor's degree might be mapped to ISCED level 6 (tertiary education).

The NQF framework delineates levels by complexity of knowledge, skills, and responsibility/ autonomy. Table 2 describes each level in detail:

Table 2: National Qualification Framework (NQF) Levels

Level	Knowledge	Skills	Responsibility & Autonomy
1	Basic general knowledge	Basic skills required to carry out simple tasks	Work or study under direct supervision in a structured context.
2	Basic factual knowledge of a field of work or study	Basic cognitive and practical skills required to use relevant information to carry out tasks and to solve routine problems using simple rules and tools	Work or study under supervision with some autonomy
3	Knowledge of facts, principles, processes and general concepts, in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	Take responsibility for completion of tasks in work or study; adapt own behavior to circumstances in solving problems
4	Factual and theoretical knowledge in broad contexts within a field of work or study	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities

[25] Caves, K., & Renold, U. (2018). *National qualifications frameworks: Understanding their role in skills development*. International Labour Organization.

Level	Knowledge	Skills	Responsibility & Autonomy
5	Comprehensive, specialized, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	Exercise management and supervision in contexts of work or study activities where there is unpredictable change; review and develop performance of self and others
6	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialized field of work or study	Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts; take responsibility for managing the professional development of individuals and groups
7	Highly specialized knowledge, some of which is at the forefront of knowledge in a field of work or study as the basis for original thinking and/or research. Clinical awareness of knowledge issues in a field and at the interface between different fields.	Specialized problem-solving skills required in research and/or innovation to develop new knowledge and procedures and to integrate knowledge from different fields	Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches; take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams
8	Knowledge at the most advanced frontier of a field of work or study and at the interface between fields	The most advanced and specialized skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice	Demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research

Source: European Qualifications Framework (EQF) (n.d.). Description of the eight EQF levels. https://europass.europa.eu/en/description-eight-eqf-levels

Occupational Information Network (O*NET)

The Occupational Information Network (O*NET)[26] is an important source of occupational information and data in the U.S. and contains detailed and standardized descriptions of over 900 occupations. The profile for each occupation provides information such as knowledge, skills, and abilities required, common work activities, tools used, related occupations, apprenticeship opportunities, and relevant education and training programs by state and ZIP Code. Additionally, the O*NET platform contains resources for employers and job seekers, including interest inventories, veteran resources, and relevant occupational crosswalks.

O*NET Historical Development and Use

O*NET dates to 1938, when the U.S. Department of Labor began documenting occupations for American workers and publishing those in the Dictionary of Occupational Titles (DOT) which was transformed into an electronic database in the 1990s (RTI).[27] In 1995, the U.S. Department of Labor renamed this occupational information tool the Occupational Information Network (O*NET), and it was established as the federal source of occupational information in 1998 (O*NET).[28]

O*NET has wide integration in workforce and human resources systems and is currently used in Colorado's workforce systems. The system provides a variety of tools and resources for both job seekers and employers, providing detailed skill mapping and job progression clarity.

[26] O*NET Interest Profiler (2024). *Occupational Information Network*. U.S. Department of Labor, Employment and Training Administration. https://www.mynextmove.org/explore/ip

[27] RTI International (2016). Occupational information network (O*NET): *Customizing survey methodologies to create a comprehensive, public database on the evolving U.S. job market.* https://www.rti.org/impact/occupational-information-network-onet

[28] O*NET (n.d.). About O*NET. https://www.onetcenter.org/overview.html#:~:text=The%20O*NET%20Program%20is,maintenance%20of%20a%20skilled%20workforce.&text=Central%20to%20the%20project%20is,North%20Carolina%20Department%20of%20Commerce.

Classification Design Process

When considering the process to assign ISCED codes to non-degree credentials, the design team recognized that the ISCED level would not be particularly meaningful by itself. Since ISCED has not been leveraged in the U.S. up to this point, it would have very little recognition or applicability immediately in either higher education or employment contexts. The team also understood that the process for assigning ISCED codes to existing stackable credential pathways is only a first step in scaling a model that will ultimately be passed on to other state agency teams for evaluation, refinement and application (Office of the Future of Work, State Apprenticeship Agency, Colorado Workforce Development Council and the Colorado Department of Education). To that end, the process created should be designed in a way that is applicable in a variety of contexts and should be predominantly viewed as a "use case," rather than a final product.

Ultimately, the design team determined that leveraging a variety of tools and resources to approach this project would create a productive template for future work with other agencies. Detailed descriptions of each component of the process are provided below, and include:

- Credential Review and Pre-Screen
- Stakeholder Feedback
- Alignment with ISCED, NQF and O*Net
- Final Classification

Credential Review & Pre Screen

A total of 69 non-degree credentials included in the stackable credential pathways were examined for inclusion in the process. The total number of non-degree credentials exceeded the total number included in the final stackable credential pathways report, as additional closely related credentials were identified in each pathway.

- **Cybersecurity- 16 credentials**
    - Information Security Analyst
    - Information Security Analyst Apprenticeship
- **Software Development- 7 credentials**
    - Full Stack Developer
    - Military to Front-End Developer
    - DevOps
- **Education- 11 credentials**
    - Early childhood- Apprenticeship to Degree
    - Early Childhood- Degree + Licensure
- **Healthcare- 22 credentials**
    - Emergency Medical Services
    - Nursing
    - Medical Technician
- **Behavioral Health- 13 credentials**
    - Social Work
    - Addiction Counseling

To build a body of evidence for each credential and determine whether it should be moved through the formal assignment process, the design team developed a pre-screening rubric. Each credential was evaluated along the following criteria:

Credential Type:

- What is the credential "type" (i.e., certificate, license, non-degree credential, apprenticeship, other)?

- What organization issues the credential (i.e., Colorado State Board of Nursing, Google, CompTIA, an institution of higher education, etc.)?

Existing Indicators of Quality Assurance:

- Has the credential already been evaluated for quality through the state's Quality Non-Degree Credential Rubric?
- Is the credential included in a Registered Apprenticeship Program through the Colorado Department of Labor and Employment?
- Is the credential part of a Career and Technical Education Pathway (secondary or postsecondary)?
- Does the credential appear on the Career Development Incentive Program (CDIP) list of approved programs?
- Does the credential appear on the Eligible Training Providers List (ETPL)? This list is maintained by CDLE and is used to identify occupational training programs that may be eligible for funding through the Workforce Innovation & Opportunity Act.
- Is the credential guaranteed to earn academic credit towards a degree program at a Colorado institution of higher education? The Colorado Community College System and the Department maintain "crosswalks" of pre-established course equivalents for certain industry certifications and military courses.
- Does completion of the credential lead to conferral of a formal award (i.e. a professional license, certification, postsecondary degree, etc.)?

Evidence of Skills, Knowledge, and Competencies

- Does receiving the credential require a formal verification of skills, knowledge and competencies (standardized exam, portfolio review, observation by a certified observer, etc.)?
- Who is the primary evaluator of skills and/or learning outcomes?

Because the primary focus of this project is the evaluation of non-degree credentials, academic degrees (associate degrees, bachelor's degrees, etc.) were excluded from this pre-screen evaluation. Some initial observations that surfaced during the pre-screening process are highlighted below:

- Some credentials require a postsecondary degree (associate degree or above), particularly in the areas of healthcare, behavioral health, and education. For example, before sitting for the National Council Licensure Examination for Registered Nurses, a candidate must first complete an associate degree in nursing (ADN) or a bachelor's of science in nursing (BSN) degree.

- Some non-degree credentials identified within the stackable frameworks provide workplace or academic currency only when bundled with other credentials but may benefit employees in other ways. This was particularly true in the behavioral health pathways. For example, the Patient Navigator, Addiction Recovery Assistant, and Behavioral Health+ credentials can stack into an Associate of Applied Science degree, but do not have standalone academic value. However, completion of the Qualified Behavioral Health Assistant (QBHA) credential allows an employee to be a part of a Medicaid-eligible care team, which provides an employee with increased earning potential. The design team designated non-degree credentials that were determined to have minimal stand-alone value as "sub-credentials" during the pre-screening process. These sub-credentials were not moved forward for assignment of ISCED and Qualification Framework levels.

- Some credentials are highly regulated by outside organizations—such as the Department of Regulatory Agencies, State Board of Nursing or the Department of Education—which is particularly true for those in healthcare, behavioral health and education—and generally require the passing of a professional licensure exam and adherence to rigorous state and/or national standards. In these cases, future work may consider creating an additional credential category such as 'professional licensure aligned credential.

- Credentials earned in software development and cybersecurity have more potential to stand alone in terms of the ability to have immediate application to work and/or potential for advancement.

- Transferability of non-degree credentials for academic credit within the higher education system is largely dependent on industry. While software development and cybersecurity credentials had more transferability through credit for prior learning as industry credentials, credentials in health and education had more transferability in Colorado's Guaranteed Transfer system and as part of Statewide Transfer Degrees.

- It is challenging to evaluate skills-based experiences, such as apprenticeships, in the current ecosystem of credential- or academic-based systems. An additional design element will likely need to be created that can adequately assess those programs. This will require an examination of competencies that are completed and evaluated through on-the-job training (OTJ) or related technical instruction (RTI).

Alignment with ISCED, NQF and O*Net

Once pre-screening was completed, the design team examined each credential and its relationship to ISCED, NQF, and O*NET. The process is described below.

ISCED Alignment

The ISCED classification system categorizes education programs (both formal and non-formal) and resulting qualifications through an equivalence system broadly based on common stages of education progression in terms of the complexity of educational content. The more advanced the program, the higher the level of education, from the pre-primary level (level 0) through doctorate or equivalent (level 8). For postsecondary programs (Levels 4-8), ISCED also recognizes "intermediate qualifications" for programs that grant a recognized certification or qualification but which, by themselves, do not constitute completion of the ISCED education level or provide direct access to a higher ISCED level. In the case of non-degree credentials that were included in stackable credential pathways, most did not meet the criteria for *completion* of a given level but rather were situated *within* a level. While some credentials require the completion of a degree (educator licensure, for example), the majority could be used in an employment setting without the completion of a formal degree. The final ISCED code assigned to each credential, therefore, reflects the level to which a credential sits within a level, rather than an indication of completion.

Utilizing the 2011 ISCED qualifications framework[29] each credential was evaluated across several domains:

- Complexity of content
- Entry requirements
- Typical duration of credential and/or learning experience
- Instructor/trainer qualifications
- Qualification (or credential) awarded

For this phase of evaluation, all credentials evaluated fell within the following ISCED education equivalency levels:

Level 3- Upper secondary education

Level 4- Postsecondary non-tertiary education

Level 5- Short-cycle tertiary education

Level 6- Bachelor's or equivalent

NQF Alignment

As noted in previous sections, the primary function of the NQF is to provide a way to determine the learning outcomes and skills necessary for an individual to be competent and effective in a particular work or learning setting. This framework is particularly useful in non-formal learning contexts that are not directly related to higher education levels. This construct is also useful in assessing more competency-based approaches to learning (i.e., apprenticeships) that may or may not lead to a formal award. The inclusion of the NQF in the coding schema provides a means to examine each credential through a skills-based lens.

[29] UNESCO Institute of Statistics (2012). *International Standard Classification of Education- ISCED 2011.* https://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf

Utilizing the Swiss version of the National Qualifications framework[30] as a template, each credential was evaluated based on the following criteria:

- **Knowledge**: level of knowledge and understanding
- **Skills**: practical, cognitive, specialized, and technical
- **Competencies**: professional, personal, and social skills
- **Responsibility and Autonomy**: level of supervision needed, self-management, ability to supervise others

While ISCED Education Levels ranged between three and six, Qualification Framework Levels had more variance in demonstration of skills and learning outcomes, ranging from level one to five. This was primarily due to the level of responsibility and/or autonomy required for a particular job, specifically those in the healthcare, education, and behavioral health industries. In these instances, even if an individual possesses a certification, there are structural and/or age requirements for being able to make medical decisions or supervise children. The cybersecurity and software development industries tended to have more ability to make independent decisions with earned certifications.

O*NET Alignment

Because O*NET is widely recognized and used in the U.S., the design team determined that including O*NET classifications would provide a useful crosswalk and/or reference for subsequent agencies engaging in the next phases of this work. Additionally, O*NET provides relevant information for each agency, including job titles, level of education/experience needed, job training requirements, and specific information regarding vocational preparation needed, along with a classification code. Finally, many of the tools and resources available in Colorado already leverage O*NET, including but not limited to the Education Training Provider list and the State Apprenticeship Resource Directory. Where applicable, related O*NET occupational classifications are included for credentials that meet the criteria for multiple industries.

[30] All Swiss Federal Authorities: Federal Law (n.d.). *National qualifications framework for vocational education and training*. https://www.fedlex.admin.ch/eli/cc/2014/488/de#art_9

Expanded Evaluation Process

In some instances, the design team found the standard processes for determining the ISCED and/or NQF levels described above were insufficient to decide with high confidence. In these situations, a more detailed process was employed to gather additional data about the credential and the jobs for which a credential-holder would be qualified. Under the expanded evaluation process, the design team gathered data related to:

1. the specific skills and knowledge required for the job(s) related to the credential (O*NET,[31] employer interviews)
2. typical duration of the credential program (Credential Engine[32], O*NET), and degree and certificate information from the Colorado Community College System[33] and the Colorado Department of Higher Education[34]
3. the level of workplace autonomy and responsibility given to individuals who earn the credential (O*NET, employer interviews)
4. the complexity and breadth of the program's content (Colorado Community College System, Colorado Department of Higher Education).

With this additional information for reference, a reviewer would then complete an Expanded Evaluation Rubric to determine the ISCED and Qualifications Framework level for the credential. The expanded rubric allows the reviewer to consider the classification components individually (e.g., complexity of content, entry requirements, and typical duration for the educational program, as well as the knowledge, skills and level of autonomy the credential-holder is expected to possess) and select the level descriptor for each component that most closely aligns with all the information in the Credential Summary. The rubric then auto-sums the number of selections by level and indicates the most appropriate ISCED and NQF level for the credential. The process utilized for this extra level of review is detailed in Appendix A.

---

[31] O*NET (n.d.) *Search O*NET-SOC occupations*. https://www.onetonline.org/
[32] Credential Registry (n.d.). *Credential finder.* https://credentialfinder.org/search

Colorado Department of Higher Education (n.d.). Degrees and certificates offered. https://highered.colorado.gov/Data/Degrees.aspx

Stakeholder Engagement

During this project, interviews were conducted with institutions of higher education and industry/employer stakeholders. The focus of these interviews was to gather insights for the credential classification project in general and learn more about the challenges and opportunities for higher education and industry. Representatives from the following institutions and organizations were interviewed for the project:

- Adams County Early Childhood Council
- Blavity, Inc.
- Clayton Early Learning
- Community College of Aurora
- Colorado Community Health Network
- Colorado Department of Early Childhood
- Colorado Department of Public Health & Environment: EMS Division
- Colorado Mountain College
- Columbine Health Systems
- Denver Health
- ECE Workforce Subcommittee
- El Paso County Early Childhood Council
- Front Range Community College
- Healthy Childcare Colorado
- St. Vrain Valley School District (Early Childhood Education)
- Jefferson Center for Mental Health
- Larimer County Economic and Workforce Development
- Metropolitan State University of Denver
- Mile High Early Learning
- Murray Security Services
- Pikes Peak State College
- Summit Stone Health
- Valley-Wide Health
- WellPower

Interview questions specific to employers examined:

- The balance between skills-based hiring versus formal education requirements
- How employers assess and value non-degree credentials (certificates, certifications, apprenticeships, etc.)
- What makes certain credential providers trustworthy and reliable
- Employee advancement and professional development practices

Interview questions specific to institutions of higher education examined:

- How colleges/universities decide which non-degree credentials to offer
- Integration of non-degree credentials within traditional degree programs
- Policies for awarding credit for prior learning for non-degree credentials
- Partnerships between educational institutions and employers
- Industry input in curriculum design and program evaluation

Both guides were created to support Colorado's goal of developing a quality assurance framework and an internationally recognized standard classification system to help employers, workers, and educators better understand and utilize the full spectrum of educational credentials available. Full interview guides can be found in Appendix B.

Employer and industry observations on hiring practices and credentials

Analysis of industry partner interviews revealed a complex landscape where employers across healthcare, early childhood education, cybersecurity, software development, and workforce development are navigating significant challenges in credential evaluation and talent pipeline development. While the proliferation of non-degree credentials offers promise for addressing skills gaps, employers struggle with quality assurance, standardization, and administrative burden in evaluating diverse credential offerings. Key themes identified during the interviews centered around quality assurance, administrative complexity, skills-based hiring tensions and talent pipeline challenges.

- **Quality Assurance and Credibility**. Employers across industries noted that there is consistent difficulty distinguishing between high-quality and low-value credentials, and concerns regarding predatory for-profit education providers who charge excessive fees for substandard training. Additionally, employers note that they tend to rely heavily on reputation and word of mouth to identify quality providers, which include industry

associations and unions. Employers also note that regulatory requirements (such as Medicaid billing and licensing standards) provide some quality assurance controls.

- **Administrative Burden and Complexity.** Industry representatives revealed that the process to vet credentials in the workforce requires a great deal of detective work across multiple systems with varying standards. Early childhood employers spend an extensive amount of time conducting "course by course" transcript analysis while navigating the complex system of regulatory requirements established through state licensing, Head Start, and the National Association for the Education of Young Children (NAEYC). Similarly, healthcare providers must meet accreditation, state licensing, and billing requirements. Cybersecurity employers note that there is more standardization in their systems but still rely on deep expertise to evaluate programs with rigor.

- **Skills-based Hiring Adoption.** There is growing interest in skills-based hiring, but employers articulate that implementation varies dramatically by industry and company size. While larger organizations struggle with standardization requirements, smaller organizations are more agile but lack resources for effective skills assessment and evaluation. Some industries (particularly the trades) have long practiced skills-based approaches. There was a consistent theme that hands-on practical experience is often more valuable than the credential itself, particularly in early childhood education, healthcare, and software development.

- **Talent Pipeline and Economic Realities.** Many industries struggle with managing the talent pipeline, where educational requirements do not match compensation levels, which is particularly evident in the early childhood education and healthcare industries. “Grow your own” solutions, including internal training programs, partnerships with high schools, and apprenticeship programs, have shown promise where they are available and implemented well, and allow for earn and learn opportunities, and the ability to stack credentials.

Industry leaders revealed that improvements in these systems would be bolstered through the creation of standardized equivalency frameworks for different credential types, increasing employer engagement and feedback, and scaling stackable credential pathways that ensure transferability and increasing levels of compensation and career progression for earners. Additionally, employers recommend building state-level technology solutions that can help with defraying costs and administrative burden, along with financial support for employer-based training.

The analysis of employer interviews reinforces that, while there is strong employer appetite for a systematic approach to credential evaluation, any solution must balance quality assurance with accessibility and administrative efficiency.

Institutional observations on industry-aligned credentials

Stakeholder interviews with institutions of higher education revealed that institutions across Colorado are experiencing a fundamental shift from faculty-driven to industry-driven credential development, while grappling with significant data collection challenges and a growing disconnect between industry rhetoric and actual hiring practices. Analysis of interviews revealed that while there are sophisticated internal processes for quality assurance, strategic stackability design, there also exist resource allocation tensions that force difficult year-to-year decisions about which industries to serve.
Key themes identified throughout centered around institutional decision making, academic program design, data collection, quality assurance, resource allocation and strategic challenges.

- **Institutional decision making**: There has been a shift from the historical model developing academic programs based on faculty expertise and academic interests to a focus on industry needs, workforce data, and advisory council feedback - from supply to demand.

- **Stackability as a core design principle**: Institutions interviewed, comprised of both associate and bachelor's degree granting institutions, are increasingly designing smaller, bite-sized programs to prevent educational dead ends while providing immediate labor market value. Successful stackable credential models developed throughout Colorado include programs in human services, addiction services, healthcare, and technical programs that begin with

certifications and stack into bachelor's degree programs. Benefits to this approach include providing multiple entry and exit points that meet diverse learner needs, increasing the ability for learners to improve employment outcomes at various educational stages, and maintaining institutional revenue through higher degree completion through a pathway approach. Challenges in the development of stackable pathways include a lack of nationally recognized quality criteria in rapidly evolving fields and an imbalance in recognition and acceptance of new and cutting-edge program development by employers.

- **Data collection and attribution challenges:** While institutions are easily able to track and evaluate traditional academic programs (enrollment, retention, completion, post-graduate outcomes, etc.), it is a challenge to isolate the impact of credentials that are embedded within degree programs. While the formal 'degree' (associate, bachelor's, master's, etc.) gets "credit" for employment outcomes, there is an inherent difficulty in measuring the impact from standalone credentials, internships, experiential learning or apprenticeships from the value of a degree, particularly when learners may earn multiple embedded credentials, or participate in multiple experiences throughout the process of earning a degree. Additionally, institutions have trouble determining whether a credential meets actual industry needs vs. workforce hiring preferences, for example, hiring for hard skills when soft skills are equally critical, and challenges in resource allocation for short-term credentials.

- **Quality Assurance and Industry Responsiveness**: Institutions noted that there is a misalignment between internal quality controls and external pressures. Institutions ensure that there are rigorous internal processes that include comprehensive curriculum review, industry alignment, student success metric development and tracking, program reviews, and financial sustainability analyses to ensure program viability. At the same time, institutions experience external pressures that affect the process by which industry standards are integrated into academic programs. Institutions must balance internal and external quality controls to ensure their programs receive external recognition of their value and meet regulatory compliance from federal, state, and accreditation agencies. Together, these quality controls add complexity and time to the development and delivery of programs.

- **Resource Allocation and Strategic Challenges:** Institutional representatives emphasized that it is impossible for institutions to serve all industries simultaneously, which forces strategic choices about annual focus areas. Institutions consider multiple decision factors that are involved, including industry demand, growth projections and regional economic development priorities, available funding and external resource opportunities, existing faculty expertise, infrastructure, student interest, and enrollment potential. They noted that to build meaningful partnerships, there is a significant time and relationship investment required to meet the varying levels of industry engagement and commitment. Additionally, it's important to balance both academic and industry needs while maintaining institutional control over educational quality.

The higher education perspective reveals institutions actively adapting to industry needs while managing complex internal processes and resource constraints, with significant opportunity for improved coordination and data-driven decision-making. Momentum between higher education and industry, particularly in the non-degree credential space, can be accelerated through increased data transparency and evaluation, regional resource coordination, and ensuring continuous feedback between industry and higher education partners to ensure rapid program adjustment.

Summary

Both industry and higher education representatives noted challenges in the development of programs and practices that meet industry demands. Industry highlighted the need to be responsive to immediate workforce demands, ensuring a strong return on their investment, the pressures of managing day-to-day hiring decisions, and ensuring that the complex process of credential verification is meaningful. Higher education highlighted the need to manage institutional resources while investing in strategic academic program development, ensuring quality assurance, and long-term sustainability of institutions while meeting the needs of today's learners in an evolving market.

Both constituent groups noted that there are critical disconnects in the ecosystem. Both higher education and industry note that there is a skills-based hiring gap, with hiring data indicating a preference toward traditional degrees, yet there is a demand to create more skills-focused programs.

While higher education struggles to quantify the value of embedded credentials within academic programs, industry wants clear evidence of academic program effectiveness in the workplace. Additionally, higher education makes annual strategic decisions regarding which industries to serve, while industry expects a more rapid response to industry demands.

There are convergence points within the two sectors, however. Both perspectives emphasized the value of creating real-time feedback mechanisms through advisory committees, the need for establishing quality assurance frameworks, the promising practice of creating stackable credential pathways, enhancing regional collaboration and coordination, and ensuring economically sustainable solutions from each sector. While the stakeholder interviews emphasize that both groups share similar goals, they face different operational challenges that require coordinated solutions that address both immediate industry needs and long-term educational infrastructure development.

Section 3 - Analysis

Final Credential Classification and Observations

The final credential classifications are listed in Tables 3-7. Each credential is delineated by industry and stackable pathway, type of credential, ISCED code, NQF classification and O*NET Standard Occupational Code (SOC) (also in Appendix D). In some cases, the credential was unable to be evaluated with confidence by the design team or was a credential that did not have standalone value. Those credentials eliminated are noted in the pre-screening rubric (Appendix C). A total of **48** credentials were included in the final coding schema:

- Healthcare- 17
- Behavioral Health- 7
- Cybersecurity- 13
- Software Development- 6
- Education (ECE)- 5

Following each classification table, observations from the design team of content experts are provided.

Table 3: Healthcare Credential Classifications

Credential	Pathway	Credential Type	ISCED Level	NQF Level	O*NET-SOC Occupation Code and Title
Emergency Medical Technician (EMT) certificate	Emergency Medical Services	Certificate	**4**	**3**	29-2042.00 - Emergency Medical Technicians
Advanced EMT certificate	Emergency Medical Services	Certificate	**4**	**3**	29-2042.00 - Emergency Medical Technicians
Paramedic certificate	Emergency Medical Services	Certificate	**5**	**4**	29-2043.00 - Paramedic
Certified Nursing Assistant (CNA) certificate	Nursing	Certificate	**4**	**3**	31-1131.00 - Nursing Assistants
Certified Medical Assistant (CMA)	Nursing	Certificate	**4**	**3**	31-9092.00 - Medical Assistants
Certified Clinical Medical Assistant (CCMA)	Nursing	Certificate	**4**	**3**	31-9092.00 - Medical Assistants
Certified Patient Care Tech/ Assistant (CPCT/A)	Nursing	Certificate	**4**	**3**	31-1131.00 - Nursing Assistants
Licensed Practical Nurse (LPN)	Nursing	Professional License	**4**	**4**	29-2061.00 - Licensed Practical and Licensed Vocational Nurses
Registered Nurse (RN) license	Nursing	Professional License	**5**	**5**	29-1141.00 - Registered Nurses
EKG Tech	Medical Technician	Certificate	**4**	**3**	29-2031.00 - Cardiovascular Technologists and Technicians
Computed Tomography Certificate	Medical Technician	Certificate	**4**	**3**	29-2034.00 - Radiologic Technologists and Technicians
Magnetic Resonance Imaging Certificate	Medical Technician	Certificate	**4**	**3**	29-2035.00 - Magnetic Resonance Imaging Technologists
Mammography Technologist Certificate	Medical Technician	Certificate	**4**	**3**	29-2034.00 - Radiologic Technologists and Technicians
Radiologic Technology Certificate	Medical Technician	Certificate	**4**	**3**	29-2034.00 - Radiologic Technologists and Technicians
Surgical Technologist Certificate	Medical Technician	Certificate	**4**	**3**	29-2055.00 - Surgical Technologists
Sonography Certificate	Medical Technician	Certificate	**4**	**3**	29-2032.00 - Diagnostic Medical Sonographers
Vascular Technology Certificate	Medical Technician	Certificate	**4**	**3**	29-2031.00 - Cardiovascular Technologists and Technicians

Healthcare pathways have highly structured credentialing due to licensing requirements and Medicaid reimbursement rules, making ISCED and O*Net coding straightforward—most certificates fell above Level 3 due to specialized knowledge requirements, while Bachelor of Science in Nursing (BSN) requirements kept most below Level 5. However, NQF framework application proved more complex because advancement in some areas (like Emergency Medical Technician to Paramedic) increases technical skills without granting supervisory autonomy, as all Emergency Medical Services providers must operate under physician direction. Similarly, nursing roles, including Certified Nursing Assistant (CNA), Licensed Practical Nurse (LPN), and Registered Nurse (RN), and Medical Assistant (MA) positions have overlapping responsibilities that complicate classification. The system is primarily driven by medical regulations and Medicaid requirements, suggesting NQF determinations would benefit from review by staff with healthcare regulatory expertise, especially as employers expand certification varieties due to advancing medical technology and digitized record-keeping. Cardiopulmonary Resuscitation (CPR) certifications presented classification challenges since they are required for other credentials but do not qualify holders for new positions, leading to their designation as sub-credentials rather than standalone qualifications.

Table 4: Behavioral Health Credential Classifications

Credential	Pathway	Credential Type	ISCED Level	NQF Level	O*NET-SOC Occupation Code and Title
Behavioral Health Assistant I – Qualified Behavioral Health Assistant (QBHA)	Social Work	Micro-credential	**3**	**2**	21-1093.00 - Social and Human Service Assistants
Peer Support Specialist	Social Work	Certificate	**3**	**2**	21-1011.00 - Substance Abuse and Behavioral Disorder Counselors
Registered Behavior Technician (RBT)	Social Work	Certification	**4**	**2**	29-2053.00 - Psychiatric Technicians
Addiction Recovery Assistant	Addiction Counseling	Micro-credential	**4**	**1**	21-1093.00 - Social and Human Service Assistants 21-1011.00 - Substance Abuse and Behavioral Disorder Counselors
Certified Addiction Technician (CAT)	Addiction Counseling	Certification	**5**	**2**	21-1011.00 - Substance Abuse and Behavioral Disorder Counselors
Certified Addiction Specialist (CAS)	Addiction Counseling	Certification	**5**	**3**	21-1011.00 - Substance Abuse and Behavioral Disorder Counselors
Licensed Addiction Counselor (LAC)	Addiction Counseling	License	**5**	**3**	21-1011.00 - Substance Abuse and Behavioral Disorder Counselors

Behavioral health, like healthcare, operates within a regulatory framework driven by reimbursement mechanisms such as Medicaid. The field's highly specialized scope-of-practice occupations are tied to formal education and licensure requirements, making it difficult to create equivalent educational opportunities through non-formal structures. To address this challenge and introduce competency-based, applied learning, the Qualified Behavioral Health Associate (QBHA) credential was developed using a series of competency-based skills identified and approved by the Department of Healthcare Policy and Financing for Medicaid inclusion.

Table 5: Cybersecurity Credential Classifications

Credential	Pathway	Credential Type	ISCED Level	NQF Level	O*NET-SOC Occupation Code and Title
CompTIA Network+	Info Sec Analyst - Ind. Cert	Certificate	**4**	**4**	15-1231.00 - Computer Network Support Specialists 15-1241.00 - Computer Network Architects
CompTIA Security+	Info Sec Analyst - Ind. Cert	Certificate	**4**	**4**	15-1299.05 - Information Security Engineers 15-1212.00 - Information Security Analysts
CompTIA A+	Info Sec Analyst - Ind. Cert	Certificate	**4**	**4**	15-1232.00 - Computer user support specialist
Cisco Network Associate (CCNA)	Info Sec Analyst - Ind. Cert	Certificate	**4**	**4**	15-1299.05 - Information Security Engineers 15-1212.00 - Information Security Analysts
CyberOps Associate	Info Sec Analyst - Ind. Cert	Certificate	**4**	**4**	15-1299.05 - Information Security Engineers 15-1212.00 - Information Security Analysts
Certified Specialist in Security: Linux (Red Hat)	Info Sec Analyst - Ind. Cert	Certificate	**4**	**4**	15-1299.05 - Information Security Engineers 15-1212.00 - Information Security Analysts
Certified Information Systems Security Professional (CISSP)	Info Sec Analyst - Ind. Cert	Certificate	**6**	**4**	15-1299.05 - Information Security Engineers 15-1212.00 - Information Security Analysts
Certified Ethical Hacker (CEH)	Info Sec Analyst - Ind. Cert	Certificate	**4**	**4**	15-1299.04 - Penetration Testers
OffSec Certified Professional (OSCP)	Info Sec Analyst - Ind. Cert	Certificate	**4**	**4**	15-1299.04 - Penetration Testers
Certified Information Systems Auditor (CISA)	Info Sec Analyst - Ind. Cert	Certificate	**6**	**4**	15-1299.06 - Digital Forensics Analysts

Credential	Pathway	Credential Type	ISCED Level	NQF Level	O*NET-SOC Occupation Code and Title
Certified Information Systems Manager (CISM)	Info Sec Analyst - Ind. Cert	Certificate	**4**	**4**	11-3021.00 - Computer and Information Systems Managers
Certificate of Cloud Security Knowledge (CCSK)	Info Sec Analyst - Apprentice	Certificate	**4**	**4**	15-1299.05 - Information Security Engineers 15-1212.00 - Information Security Analysts
Certified Cloud Security Professional (CCSP)	Info Sec Analyst - Apprentice	Certificate	**4**	**4**	15-1299.05 - Information Security Engineers 15-1212.00 - Information Security Analysts

Table 6: Software Development Credential Classifications

Credential	Pathway	Credential Type	ISCED Level	NQF Level	O*NET-SOC Occupation Code and Title
ISTQB Foundational or CAST	Full Stack Dev.	Certificate	**4**	**4**	15-1252.00 - Software Developers
CompTIA Security+	Full Stack Dev.	Certificate	**4**	**4**	15-1299.05 - Information Security Engineers 15-1212.00 - Information Security Analysts
AWS certification	Full Stack Dev.	Certificate	**4**	**4**	15-1252.00 - Software Developers
Microsoft certification	Full Stack Dev.	Certificate	**4**	**4**	15-1252.00 - Software Developers
Google certification	Full Stack Dev.	Certificate	**4**	**4**	15-1252.00 - Software Developers

Cybersecurity and software development offer numerous certifications from trusted organizations like Microsoft, Amazon Web Services, and Google. While employers value these credentials, most do not require them for hiring. Instead, employers rely on interviews that assess work experience and problem-solving skills through coding challenges.

These certifications typically equal 1-3 college courses and are delivered through formal education or vendor-specific training. However, employers emphasize that credentials alone do not qualify someone for employment, classifying the most valued of these credentials as ISCED Level 4.

Most credentials do not address supervision skills, though many mid-level developers hold informal leadership roles within teams, so more evaluation of NQF may be necessary to address skills that encompass responsibility and autonomy.

The abundance of available credentials combined with their moderate employer value creates a need to identify high-quality, employer-valued certifications to guide students and job seekers in making informed decisions.

Table 7: Education (Early Childhood Education) Credential Classifications

Credential	Pathway	Credential Type	ISCED Level	NQF Level	O*NET-SOC Occupation Code and Title
Child Development Associate Credential	ECE to Degree	Certification	**4**	**3**	39-9011.00 - Childcare Workers 25-2011.00 - Preschool Teachers, Except Special Education
Early Childhood Assistant Teacher Certificate	ECE to Degree	Certification	**4**	**2**	25-9042.00 - Teaching Assistants, Preschool, Elementary, Middle, and Secondary School, Except Special Ed.
Early Childhood Teacher Certificate	ECE to Degree	Certificate	**4**	**4**	25-2011.00 - Preschool Teachers, Except Special Ed.
Infant/Toddler Supervisor Certificate	ECE to Degree	Certificate	**4**	**4**	39-9011.00 - Childcare Workers
Early Childhood Education - Director Certificate	ECE to Degree	Certificate	**4**	**5**	11-9031.00 - Education and Childcare Administrators, Preschool and Daycare

The early childhood education field faces a fundamental credentialing challenge where high staffing needs clash with strict qualification requirements, compounded by low wages that prevent workers from affording the additional training needed for advancement.

Colorado's Department of Early Childhood (CDEC) has responded by creating multiple qualification pathways that can vary dramatically across settings (Head Start programs, Colorado-licensed programs, school district-affiliated preschools, private preschools, in-home childcare) and by age of children served. For example, the department identifies 9 distinct pathways for teachers, 3 for assistant teachers, 7 for infant supervisors, and 6 for center directors.

To address this complexity, CDEC developed the voluntary Early Childhood Professional Credential (ECPC) 3.0 system, which awards points across four areas: formal education (degrees, coursework, and specialized training), professional development (recent training hours and continuing education), experience (years in the field), and demonstrated competencies (classroom observation scores). Points determine one of six ECPC credential levels, promoting skills-based hiring and skills-based advancement while recognizing diverse learning methods and providing standardized competency verification.

CDEC incentivizes participation by linking ECPC levels to tax credits for individuals and quality ratings for programs, encouraging use of their Professional Development Information System (PDIS). While this system clarifies pathways and could serve as a model for establishing credential equivalencies in other industries, its flexibility creates significant complexity. Teachers can qualify through various combinations of education, experience, and competencies, making it difficult to map specific credentials to positions. However, clear safety-based distinctions between roles that can and cannot independently supervise children provided practical anchor points that simplified some qualification framework decisions.

Section 4 - Recommendations and Next Steps

As highlighted in previous sections, this qualification and classification process is Colorado's first attempt at a systemic approach to align non-formal learning with international standards. As such, this framework should be viewed as a prototype for the work moving forward in other state agencies (OFW, SAA, CWDC, CDE), and the state should expect that changes and adjustments to the framework will be made.

The prescreening and final classification processes were rooted in the International Standard Classification of Education, as required by statute. The addition of the National Qualifications Framework was included to provide an alternative and needed examination of credentials that is more closely aligned with the evaluation of non-formal learning opportunities, and may be more applicable moving forward, particularly for work-based learning experiences such as apprenticeships. Finally, O*NET was provided in the final coding schema to align with a longstanding system that is widely recognized and utilized in the U.S. context.

Based on the process of creating a prototype classification framework, hearing perspectives of industry and higher education representatives, and the final classification of credentials, the following recommendations are offered as this work moves forward.

1. **Review and refine the prototype classification framework** to ensure that it is transferable, applicable, and relevant to other state agencies and industry partners. This may result in adding criteria in the pre-screening process, inclusion of additional or elimination of final classification criteria, or developing additional rigorous screening and evaluation criteria that captures the nuance of other types of learning (apprenticeship, work-based learning, etc.). The design team strongly recommends continued inclusion of the National Qualifications Framework as part of the credential classification process during the next phase of this work, which involves assessment of registered apprenticeships. The relevant state agencies should then determine the most appropriate

evaluation criteria for non-formal learning, which may include either NQF or ISCED or both in the final classification framework. Once refinements to the prototype are complete, the design team recommends the creation of a practical guide or technical manual for ongoing implementation and classification.

2. **Establish a systematic process for ongoing classification** of new credentials and apprenticeship programs. The process developed by the initial design team is currently very manual. The state may consider a technological solution that could help to systemize or automate the process. There are current partnerships with Credential Engine throughout the state, and the team recommends collaborating with them or a similar partner to help refine and build upon this work. Many references to the use of artificial intelligence were made throughout the process that could help alleviate some of the manual burden in the future, which should be examined.

3. **Enhance employer and higher education engagement** to ensure classification relevance and industry recognition. The interviews completed to date focused on challenges and opportunities identified by partners in the non-credential space. This feedback should be a critical component of the ongoing design and implementation of a robust new classification framework.

4. **Create and expand cross-agency coordination mechanisms** to ensure consistent implementation of the ongoing classification process. While this is a statutory requirement, it would be advisable to continue to have iterative conversations among agencies to ensure that changes and updates to the classification system, if any, are communicated and refined collaboratively to ensure consistency over time.

5. **Create quality assurance processes** for credentials and non-formal learning. The design team recognizes that this project to date has been the development of a prototype that will need to be refined in ongoing phases, which should include an iterative feedback loop with industry and higher education to establish a quality assurance framework for the evaluation of credentials that are to be classified on an ongoing basis.

Next Steps

The framework developed through this initiative will transfer to partner agencies, including the Office of the Future of Work, State Apprenticeship Agency, Colorado Workforce Development Council, and Colorado Department of Education for broader implementation and adjustment as necessary. Continued stakeholder engagement and system refinement will ensure the classification framework remains responsive to evolving industry needs and maintains alignment with national and international standards.

Acknowledgments

In addition to internal staff, the Department would like to express their appreciation to the following individuals who made enormous contributions to the research and development of this project:

Dr. Katherine Caves
Lab Director of Center on the Economics and Management of Education and Training Systems (CEMETS)
Chair of Education Systems at ETH Zürich

Dr. Eric Dunker
Chief Growth Officer and
Founding Executive Director
National Center for the Apprenticeship Degree
Reach University

Scott Fast*
Director, Colorado Projects
Innovate + Educate

Katherine Keegan*
Former Director
Office of the Future of Work
State of Colorado

Erin Silver*
Founder and President
Envision Strategy Group

Dr. Linda Van Doren
Vice President of Education, Workforce Development, Leadership for Educational Equity, Postsecondary CTE
Emily Griffith Technical College

Renise Walker*
Assistant Director, Systems Innovation
Colorado Workforce Development Council

*Design team member

SECTION 5 - Appendices

Appendix A - Expanded Evaluation Process: Credential Summary and Expanded Rubric

In instances when the design team found the standard processes for determining ISCED and/or NQF levels were insufficient to decide with high confidence, an expanded evaluation process was employed. Additional data was gathered to more fully identify 1) the specific skills and knowledge represented by the credential, 2) the typical duration of the credential program, 3) the level of workplace autonomy and responsibility given to individuals who earn the credential, and 4) the complexity and breadth of the program's content.

Primary sources for this information included:

- **O*NET** – The Occupational Information Network database administered by the U.S. Department of Labor (https://www.onetonline.org/), searchable by occupation keyword or SOC code
- **Credential Engine's Credential Finder** – A public, web-based application that allows users to search credential and skill information from the Credential Engine Registry (https://credentialfinder.org/search?searchType=credential)
- **Colorado Community College System's** overview of degree and certificate programs (https://cccs.edu/colleges-programs/programs/) and (https://cccs.edu/colleges-programs/programs/workforce-programs/)
- **Colorado Department of Higher Education's** Database of degrees and Certificates Offered – searchable by CIP code (https://highered.colorado.gov/Data/Degrees.aspx)

These additional data were grouped into the following categories to create a Credential Summary that aided in determining the appropriate ISCED level and Qualifications Framework level of the credential in question:

Knowledge

- O*NET Worker Requirements – "Knowledge"
- O*NET Occupation-Specific Information – "Tasks"
- Colorado Community College System - Colleges & Programs – Program descriptions, course descriptions, and credit requirements for each CCCS college that offers the program.

Skills

- O*NET Worker Requirements – "Skills"
- O*NET Occupation-Specific Information – "Tools Used"
- O*NET Occupational Requirements – "Work Activities Outline"
- O*NET Occupational Requirements – "Detailed Work Activities"

Autonomy & Responsibility

- O*NET "Work Styles" (top 5)
- Credential Engine's Credential Finder – "Requirements Description" (Entry Requirements)

Typical Program Duration

- Credential Engine's Credential Finder – Time Estimate
- Credential Engine's Credential Finder – Required Credit | Contact Hours
- O*NET Education (education requirement cited by the largest percentage)
- CDHE - Degrees and Certificates Offered by Institution - Award Level Detail
- Colorado Community College System - Colleges & Programs – Program descriptions, course descriptions, and credit requirements for each CCCS college that offers the program.

Other

- O*NET “Related Occupations” (with SOC codes)
- O*NET “National Professional Associations”
- O*NET “Accreditation, Certification, & Unions”
- O*NET “Experience Requirements – Training & Credentials”
- O*NET “State Training” (program, school/provider, number of recent Graduates by credential type)
- O*NET “Certifications”
- O*NET “State Licenses”
- O*NET “Experience Requirements – Apprenticeship Opportunities”
- Credential Engine’s Credential Finder – “Apprenticeship Certificate” (Apprenticeships)
- CDHE - Degrees and Certificates Offered by Institution - public and private institutions offering/awarding degrees and certificates related to the CIP category.

The credential summary created for the Early Childhood Education Teaching Assistant credential is provided as an example below.

Figure 3: Example Credential Summary: Early Childhood Education Teaching Assistant

Credential:

Early Childhood Education - Teaching Assistant / Preschool Teaching Assistant

Standard Occupational Classification (SOC) Code(s):

25-9042.00 Teaching Assistants, Preschool, Elementary, Middle, and Secondary School, Except Special Education

O*NET Description: Assist a preschool, elementary, middle, or secondary school teacher with instructional duties. Serve in a position for which a teacher has primary responsibility for the design and implementation of educational programs and services.

Sample of reported job titles: Classroom Aide, Educational Assistant, Instructional Assistant, Kindergarten Assistant, Paraeducator, Paraprofessional, Preschool Aide, TA (Teacher Assistant), TA (Teaching Assistant), Teacher Aide

Knowledge

Customer and Personal Service — Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.

English Language — Knowledge of the structure and content of the English language including the meaning and spelling of words, and rules of composition and grammar.

Psychology — Knowledge of human behavior and performance; individual differences in ability, personality, and interests; learning and motivation; psychological research methods; and the assessment and treatment of behavioral and affective disorders.

Mathematics — Knowledge of arithmetic

Education and Training — Knowledge of teaching and instruction for individuals and groups and the measurement of training effects.

Skills

Active Listening — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

Social Perceptiveness — Being aware of others' reactions and understanding why they react as they do.

Reading Comprehension — Understanding written sentences and paragraphs in work-related documents.

Speaking — Talking to others to convey information effectively.

Coordination — Adjusting actions in relation to others' actions.

Service Orientation — Actively looking for ways to help people.

Critical Thinking — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions, or approaches to problems.

Instructing — Teaching others how to do something.

Tasks

1. Supervise students in classrooms, halls, cafeterias, school yards, and gymnasiums, or on field trips.
2. Tutor and assist children individually or in small groups to help them master assignments and to reinforce learning concepts presented by teachers.
3. Enforce administration policies and rules governing students.
4. Teach social skills to students.
5. Instruct and monitor students in the use and care of equipment and materials to prevent injuries and damage.
6. Discuss assigned duties with classroom teachers to coordinate instructional efforts.
7. Present subject matter to students under the direction and guidance of teachers, using lectures, discussions, supervised role-playing methods, or by reading aloud.
8. Clean classrooms.
9. Observe students' performance, and record relevant data to assess progress.
10. Organize and label materials and display students' work in a manner appropriate for their eye levels and perceptual skills.

11 Organize and supervise games and other recreational activities to promote physical, mental, and social development.

12 Attend staff meetings and serve on committees, as required.

13 Use computers, audio-visual aids, and other equipment and materials to supplement presentations.

14 Prepare lesson materials, bulletin board displays, exhibits, equipment, and demonstrations.

15 Conduct demonstrations to teach skills, such as sports, dancing, and handicrafts.

Work Styles

Dependability — Job requires being reliable, responsible, and dependable, and fulfilling obligations.

Concern for Others — Job requires being sensitive to others' needs and feelings and being understanding and helpful on the job.

Adaptability/Flexibility — Job requires being open to change (positive or negative) and to considerable variety in the workplace

Integrity — Job requires being honest and ethical.

Cooperation — Job requires being pleasant with others on the job and displaying a good-natured, cooperative attitude.

Education

27% High school diploma or equivalent required

20% Post-secondary certificate required

17% Some college, no degree required

O*NET Job Zone Three: Medium Preparation Needed

Education Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree.

Related Experience Previous work-related skill, knowledge, or experience is required for these occupations. For example, completion of an apprenticeship or several years of vocational training and often passing a licensing exam, in order to perform the job.

Job Training Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.

SVP Range (6.0 to < 7.0)

6.0 Over 1 year up to and including 2 years

7.0 Over 2 years up to and including 4 years

Related Occupations

25-2021.00 Elementary School Teachers, Except Special Education

National Professional Associations

American Montessori Society

Association for Early Learning Leaders

Association of American Educators

Accreditation, Certification, & Unions

American Federation of State, County and Municipal Employees, AFL-CIO

American Federation of Teachers, AFL-CIO external site

National Education Association

Largest Colorado-Based Training Providers

School	*certificate: <12 weeks*	*certificate: <1 year*	*certificate: >1 <2 yr*
Community College of Denver	157	38	18
Front Range Community College	94	72	42
Pueblo Community College	87	25	17
Community College of Aurora	77	6	8
Arapahoe Community College	57	17	8

With the additional information from a Credential Summary for reference, a reviewer would then complete an Expanded Rubric for ISCED and Qualifications Framework level determination for the credential. The expanded rubric allows the reviewer to consider the classification components individually (e.g., complexity of content, entry requirements and typical duration for the educational program, as well as the knowledge, skills and level of autonomy the credential holder is expected to possess) and select the level descriptor that most closely aligns with all the information in the Credential Summary. The rubric then auto-sums the number of selections by level and indicates the most appropriate ISCED and NQF level for the credential. An example of a completed Expanded Rubric for the Early Childhood Education Teaching Assistant credential and position is provided on the next page.

Figure 4: Example Expanded Rubric for ISCED and Qualifications Framework Level Determination: Early Childhood Teaching Assistant – ISCED Determination

Credential: **Early Childhood Education - Teaching Assistant / Preschool Teaching Assistant**

ISCED Level	Education Level	Current UNESCO Description (2011)		Complexity of Content		Entry Requirements		Typical Duration		Qualification Awarded	
3	Upper secondary education	Second/final stage of secondary education preparing for tertiary education and/or providing skills relevant to employment. Usually with an increased range of subject options and streams.	☐	Programs which form the final stage of secondary education may be either general or vocational. Vocational programs offered in parallel with other upper secondary programs should be classified at level 3. Second-cycle vocational programs which run in parallel to other programs at the upper secondary level (mostly general programs) should be normally classified at level 3.	☒	Requires completion of lower secondary education (ISCED level 2) or the ability to handle ISCED level 3 content through a combination of prior education as well as life and work experiences.	☐	3-4 years. Level 3 programs usually end around age 17 or 18)	☐	High School Diploma (or equivalent: GED, HiSET, TASC). Some Basic Technical Certificates.	☐
4	Post-secondary non-tertiary education	Programs providing learning experiences that build on secondary education and prepare for labor market entry and/or tertiary education. The content is broader than secondary but not as complex as tertiary education.	☒	Content not sufficiently complex to be regarded as tertiary education, although it is clearly post-secondary. Content is often not more advanced than level 3 programs but is typically more specialized or detailed. Programs following successful completion of upper secondary education which are either designed to broaden the options for progression to the tertiary level, or are second-cycle vocational programs should be classified at level 4.	☐	Completion of an ISCED level 3 Program (usually a high school diploma or equivalent)	☒	6 months to 2 or 3 years.	☐	Examples include certificates/certificat ions, micro-credentials, some Basic Technical Certificates. Technical Level 1 Certificate. Technical Level 2 Certificate	☒
5	Short-cycle tertiary education	Short first tertiary programs that are typically practically-based, occupationally-specific and prepare for labor market entry. These programs may also provide a pathway to other tertiary programs.	☐	Programs are usually practically-based, occupationally-specific and prepare students to enter the labor market. However, they may also provide a pathway to other tertiary education programs (Levels 6 or 7). Content is more complex than in secondary (Level 3) or post-secondary non-tertiary education (Level 4), but less complex than in level 6 programs.	☐	Completion of an ISCED level 3 Program (usually a high school diploma or equivalent)	☐	2 to 3 years. Minimum duration of 2 years.	☐	Associate Degree (or TVET equivalent)	☐
6	Bachelor's or equivalent	Programs designed to provide intermediate academic and/or professional knowledge, skills and competencies leading to a first tertiary degree or equivalent qualification.	☐	Often designed to provide participants with intermediate academic and/or professional knowledge, skills and competencies, leading to a first degree or equivalent qualification. They may include practical components and/or involve periods of work experience as well as theoretically-based studies. Longer and more theoretically- and/or professionally-based content than ISCED level 5 programs.	☐	Completion of an ISCED level 3 or 4 program with access to tertiary education.	☐	3 to 4 years when directly following ISCED level 3; or 1 to 2 years when following another ISCED level 6 program.	☐	Bachelor's Degree. Programs at this level typically lead to first degrees. Programs leading to a second or further degree may be included in ISCED level 6 if they are equivalent in complexity.	☐

Figure 5: Example Expanded Rubric for ISCED and Qualifications Framework Level Determination: Early Childhood Teaching Assistant – NQF Knowledge Components

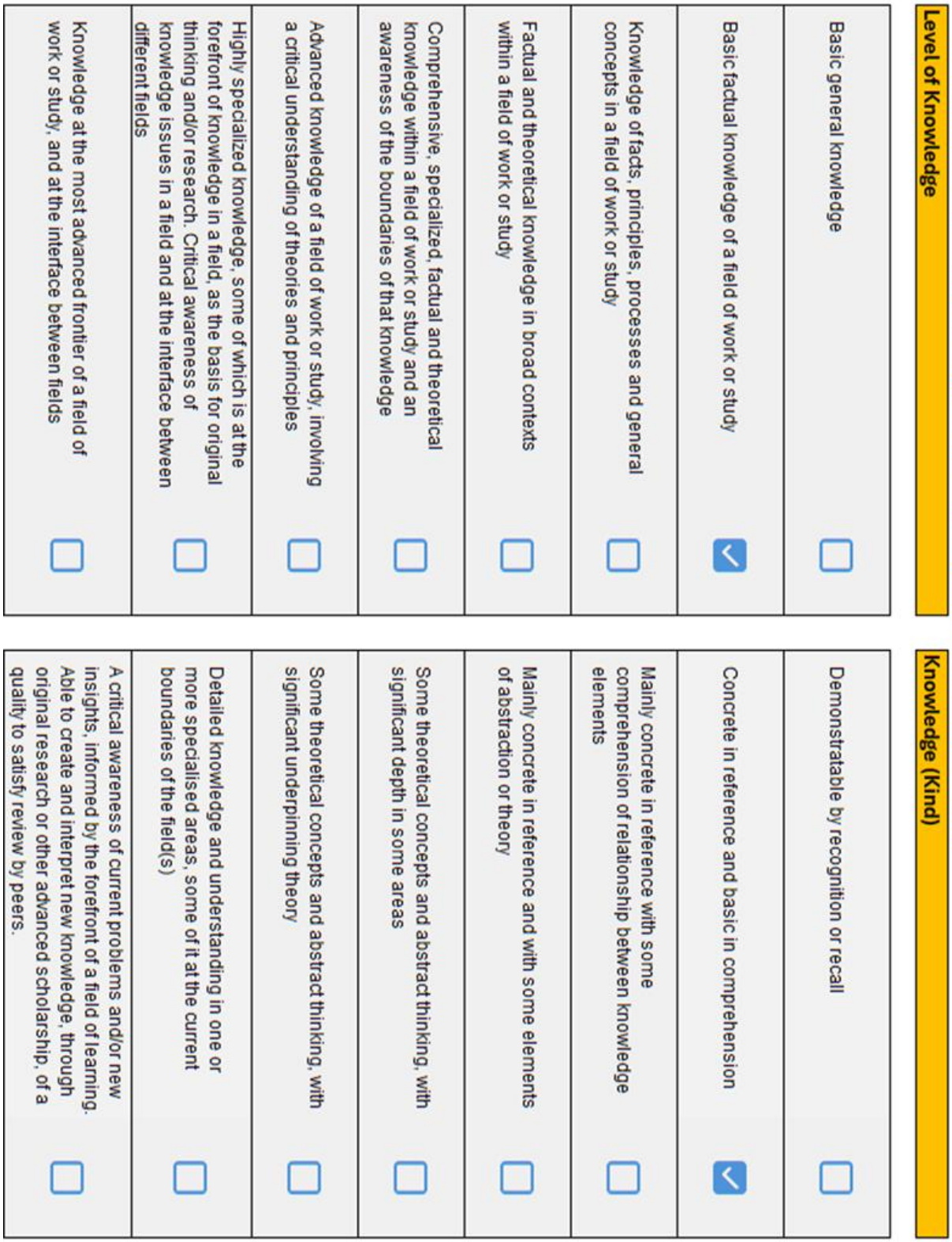


Figure 6: Example Expanded Rubric for ISCED and Qualifications Framework Level Determination: Early Childhood Teaching Assistant – NQF Skills Components

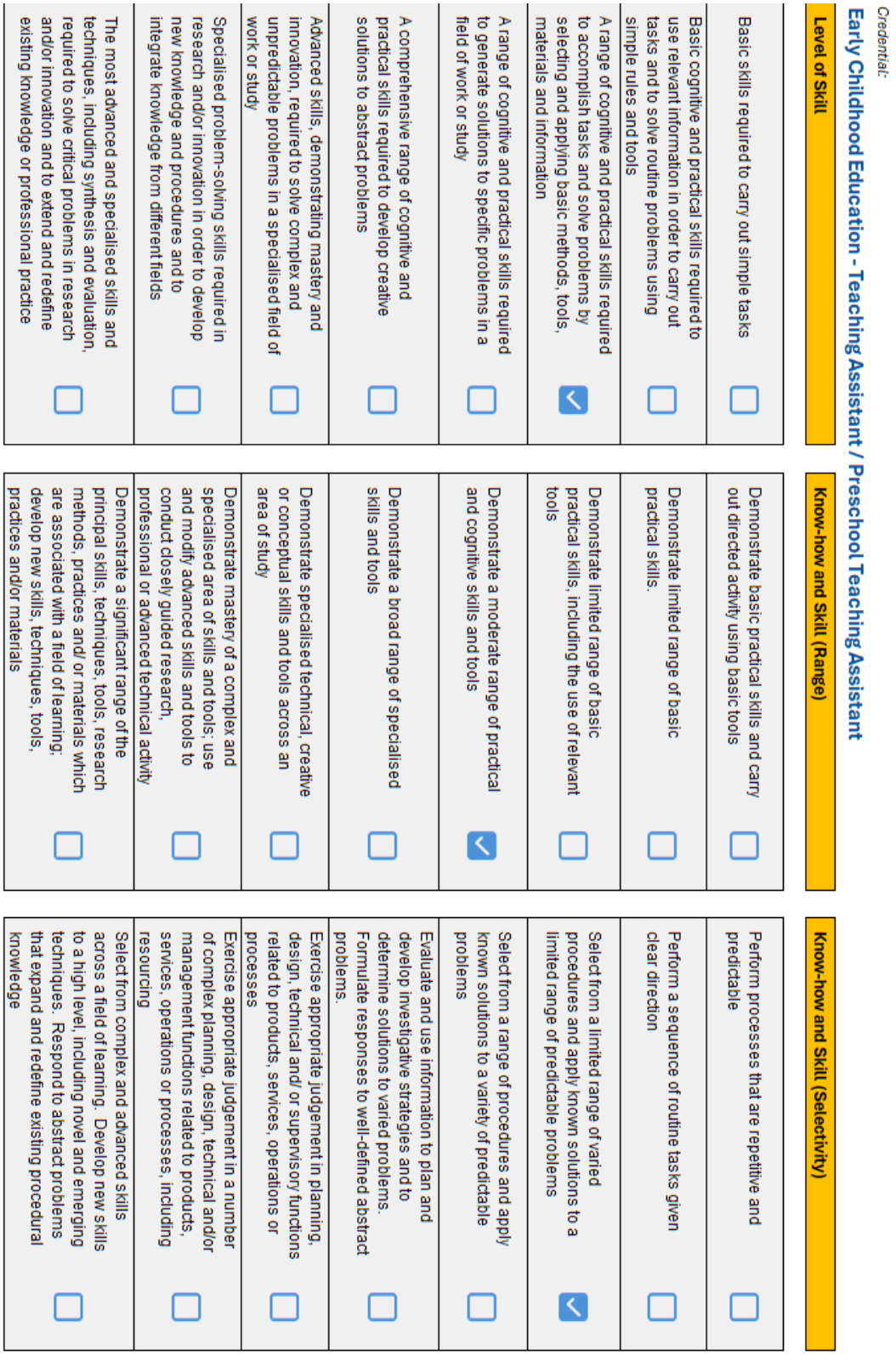


Figure 7: Example Expanded Rubric for ISCED and Qualifications Framework Level Determination: Early Childhood Teaching Assistant – NQF Autonomy and Responsibility Components

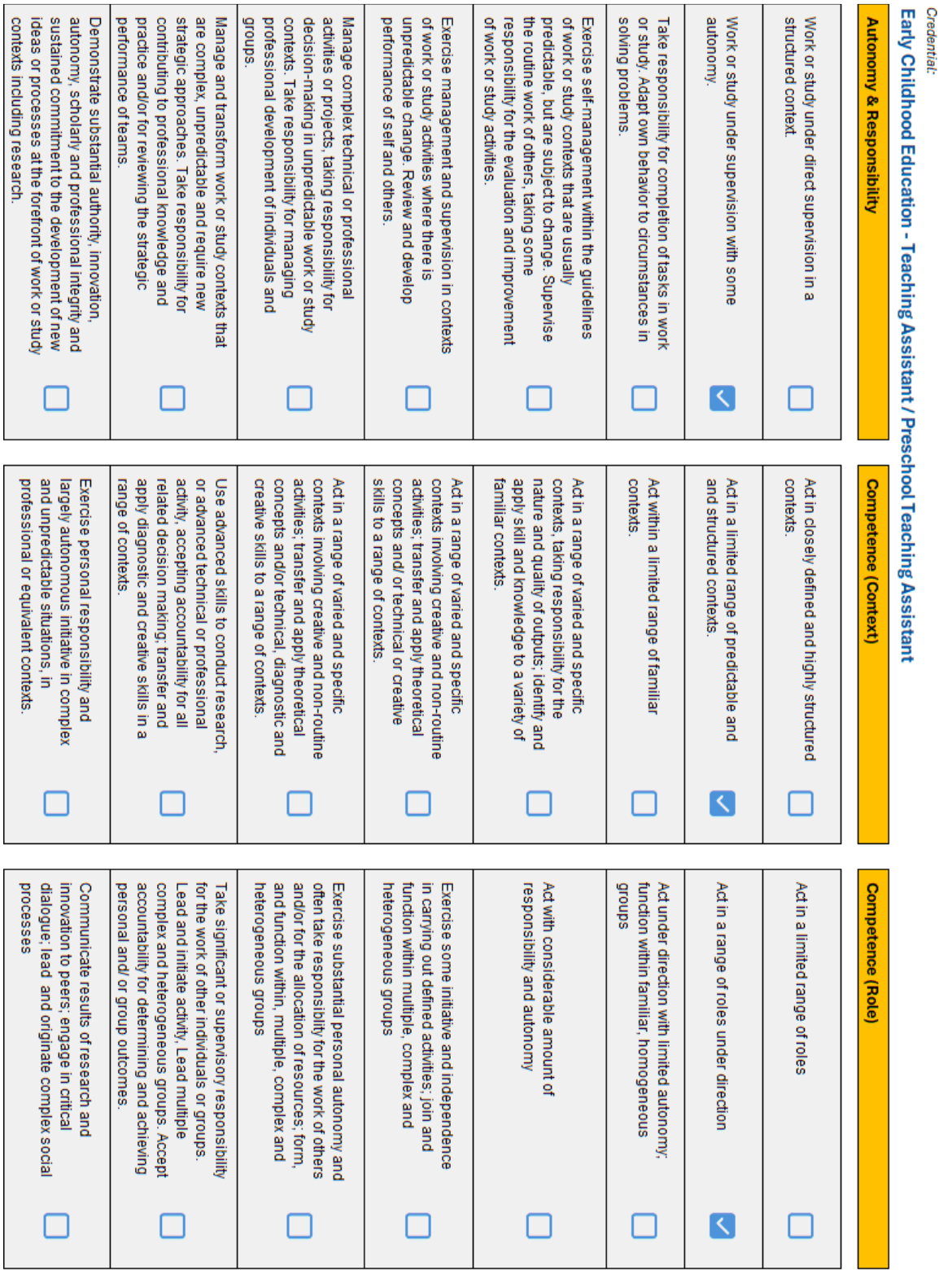
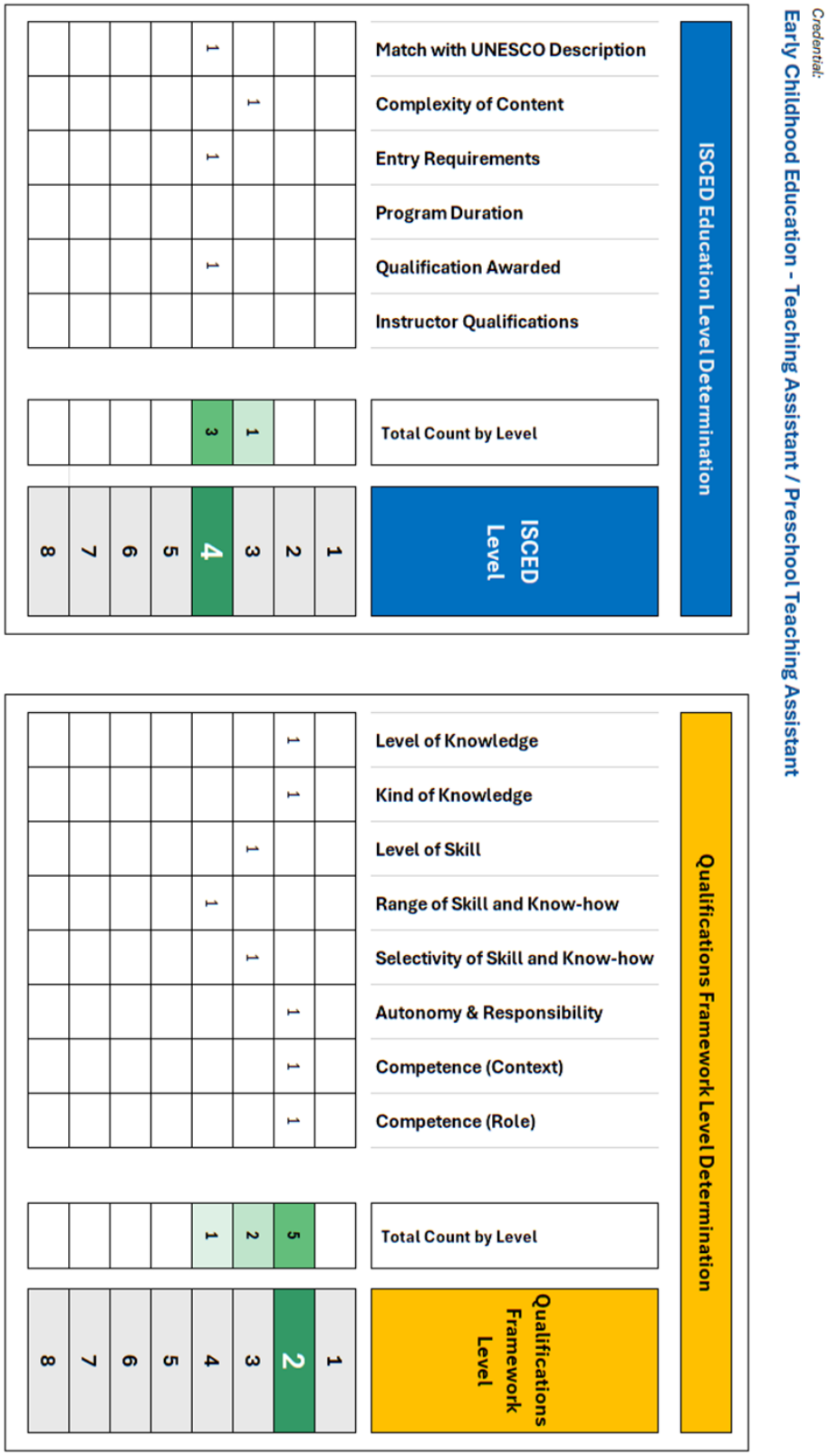


Figure 8: Example Expanded Rubric for ISCED and Qualifications Framework Level Determination: Early Childhood Teaching Assistant – Rubric Score Sheet



Appendix B - Interview Guides

Institution of Higher Education Interview Guide

Introduction

Current Issues Affecting the Colorado Workforce:

1. **Rapidly changing workforce needs.** While traditional degree programs remain the cornerstone of our postsecondary education system, they cannot fully meet Colorado's evolving skilled workforce needs.

2. **A need for practical ways for Colorado workers to upskill and reskill.** Non-degree credentials – such as certificates, certifications, occupational licenses, apprenticeships, and micro-credentials – provide a valuable and complementary approach to bridging the skills gap. They offer learners a practical and expedited pathway to acquire the precise skills that employers urgently require to meet their immediate workforce needs.

3. **A growing multitude of education and training options - with variable quality.** There are over 1 million unique education credentials available in the United States. This places a considerable burden on both employers and learners as they try to navigate this space.

Our charge for this project:

“Colorado requires a system that brings quality assurance, clarity, and order to the complex landscape of both nondegree and traditional degree credentials…” – by employing “a quality assurance framework and an internationally recognized standard classification system.”

Questions

The IHE as a provider of non-degree credentials

1. Does your institution/college/department offer non-degree credentials like certificates, microcredentials, internships, and apprenticeships in addition to more traditional degree programs?

If yes…

2. How does the institution (or department) decide which non-degree credentials to offer? How do you ensure its quality and value?
3. When developing a non-degree credential offering, what instructor qualification are considered? Why?

Non-degree credentials as an embedded component of degree programs/majors

4. If you have embedded non-degree credentials into your degree pathways, do you know what prompted the decision to embed it?
5. Do you survey employers and industry to understand whether non-degree credentials should build into a more formalized degree pathway (e.g., associate, bachelors, masters, etc.)?
6. Does the institution/department collect any data to determine the value and effectiveness of these embedded credentials (e.g., employment rates and income levels for graduates, employer feedback, student feedback, etc.)?

Credit for prior learning and non-degree credentials

7. What is your institution's/college's/department's policy for awarding credit for prior learning?

   Prompts:

   - Who makes decisions re: CPL?
   - Is the decision process the same across the institution – or does it differ by program/major/course?

8. Does the IHE have specific CPL policies/practices in place for students entering with a non-degree credential? If so, please share more about these policies? How does your institution determine the CPL's validity?

Partnering with Employers and Industry

9. How would you describe the level of partnership between your college/university/ department and the employers that hire your graduates?

   Prompts:

   - How formal or informal are the partnerships?
   - What do you feel are the strengths and areas for improvement of your current partnerships?
   - What are the primary factors that limit you from strengthening/expanding these partnerships?

10. To what degree do your employer or industry partners have a say in designing, evaluating, and updating program curriculum?
11. Do you have connections from the employer side to which you can introduce us so we may gather their thoughts on this topic?
12. Do you have questions for us?

Industry/ Employer Interview Guide

Introduction

Current Issues Affecting the Colorado Workforce:

1. Rapidly changing workforce needs. While traditional degree programs remain a big part of our postsecondary education system, they cannot fully meet Colorado's evolving skilled workforce needs.

2. The need for practical ways for workers to upskill and reskill. Non-degree credentials – such as certificates, certifications, occupational licenses, apprenticeships, and micro-credentials – provide a valuable and complementary approach to bridging the skills gap. They offer learners a practical and expedited pathway to acquire the precise skills that employers urgently require to meet their immediate workforce needs.

3. A multitude of options - with variable quality. There are over 1 million unique education credentials available in the United States. This places a considerable burden on both employers and learners as they try to navigate this space.

Our charge:

"Colorado requires a system that brings quality assurance, clarity, and order to the complex landscape of both nondegree and traditional degree credentials…" – by employing "a quality assurance framework and an internationally recognized standard classification system."

Questions

Hiring Practices

1. Can you give me a high-level overview of your organization's hiring practices?

   Prompts:

   - To what extent do you incorporate skills-based hiring vs. an evaluation of the candidate's formal education credentials (completion of an academic degree(s), years of formal training, completion of an industry apprenticeship, etc.)?
   - What is the typical process for writing a job description/job announcement (especially the minimum and preferred qualifications sections)? What sources do you consult? How is the pay range determined?
   - What do you see as the main benefits and challenges (or "gaps") of your current hiring practices in terms of your ability to hire the quality and quantity of new employees you require?

2. How does your organization typically determine whether a candidate possesses the required qualifications and competencies for a position?

   Prompt:

   - Is this process different when assessing "hard skills" vs. "soft skills"?

3. How does your organization make decisions about employee advancement/promotion?

   Prompts:

   - Do you encourage employees to complete certain training or education programs as a means to "move up" in the organization? If so, how is this communicated to employees?
   - Does your organization provide assistance to employees who pursue additional job-related training or education? (could be financial assistance, flexible schedules to allow time for participation/study, a guaranteed pay increase upon completion, etc.)

Views on Non-Degree Credentials

4. Are there any new or emerging credentials (certifications, professional licenses, apprenticeships, micro-credentials, individual skills, etc.) that are becoming highly valued in your industry or within your organization?
5. Do you have "preferred sources" for individuals with the credentials you need? (i.e. are there certain programs, providers, schools, or apprenticeships that you frequently hire from)? If so, what makes those sources appealing/credible?
6. In your experience, are there non-degree credentials in your industry that you can count on as a reliable indicator of the skills and competencies of the credential-holder? Are there some that you don't feel are reliable indicators of skills and competencies?
7. If you were presented with a new or unfamiliar credential on an application, how would you go about determining the value, quality, and applicability of that credential?

   Prompts:

   - What specific types (and level) of information would you want to have to make this determination?
   - Are there specific skills, knowledge or capabilities you would want to be able to verify?
   - Which organizations do you feel could provide credible and useful information about a credential?

Appendix C - Pre-Screening Evaluation Rubric

To build a body of evidence for each credential and determine whether it should be moved through the formal assignment process, the design team developed a pre-screening rubric. Each credential was evaluated along the following criteria: Credential Type; Existing Indicators of Quality Assurance; and Evidence of Skills, Knowledge, and Competencies.

Full evaluations are available from the Pre-Screening Tool: https://cdhe.colorado.gov/isced

Data Sources for Pre-screening Rubric

Resource	Link
CCCS Prior Learning Assessment **(PLA)** Credit Crosswalk Matrix - see the "Industry Certifications" tab	https://cccs.edu/wp-content/uploads/2024/06/PLA_Matrix_May2024.xlsx
Career Development Incentive Program **(CDIP)** - List of Approved Programs 2025-26 (new)	Appendix D - 2025-2026 Career Development Incentive Program Approved Program List
Colorado Registered Apprenticeship Programs **(RAP)** Directory	https://socgov13.my.site.com/apprenticeshipdirectory/s/
List of current, approved career and technical education **(CTE)** programs at the middle, high school, and postsecondary levels.	https://cccs-cte-reporting-ui.azurewebsites.net/
Colorado's Eligible Training Provider List **(ETPL)**	https://www.cotrainingproviders.org/#/
Military PLA Complete Evaluations	https://cccs.edu/wp-content/uploads/2024/06/Military-PLA-Complete-Evaluations-7.14.20.xlsx
Credit for military training policies by IHE:	https://cdhe.colorado.gov/students/attending-college/get-credit-for-what-you-already-know/get-credit-for-military-training
Colorado Dept. of Regulatory Agencies - Division of Professions and Occupations. Select a board name (e.g. Addiction Counselors, Nursing, Social Work, Surgical Technologists) to see the License Types available	https://apps2.colorado.gov/dora/licensing/lookup/generateroster.aspx
CCCS digital badges on the Credly badging platform	https://www.credly.com/organizations/cccs/badges
Credential Engine	https://credentialfinder.org/search

Rubric Evaluation Fields

Criteria	Response Choices
Credential Name	Name of Credential
Industry	Behavioral Health Cybersecurity Healthcare Software Development Education (ECE) other
Stackable Pathway (if applicable)	Social Work Addiction Counseling Info Sec (cert or apprenticeship) ECE (degree or apprenticeship) Emergency Medical Service Nursing Medical Technician Full Stack Developer Military to FE Developer Dev Ops.
Type of credential (certificate, license, NDC, apprenticeship, other)	Name of credential type
Issuer of Credential (ie- Colorado Board of Nursing, Google, Linux, CDE, an IHE, etc)	Name of issuer
Has the credential been evaluated through the Quality NDC Rubric?	Yes No Needs more information
Is the credential in an apprenticeship pathway?	Yes No Related Training Needs more information
Is the credential in a CTE pathway?	Yes- Secondary Yes- Postsecondary Needs more information No
Is the credential on the current list of CDIP programs?	Yes No
Is the credential on the ETPL Registry?	Yes No
Does the credential transfer into (or is part of) a degree program (choose all that apply)?	GT Pathways Statewide Articulation Agreement Associate's Degree Bachelor's Degree Any PLA Needs more information No
Does completion lead to conferral of a formal award? professional license, certification, postsecondary degree, etc?	Yes No Needs more information
Is there evidence that the credential requires evidence-based demonstration of skills through mastery, exam, practicum, work-based learning, etc? For licenses and many certifications, this may relate to column E - "Issuer of Credential"	Yes No Needs more information
Notes	Any additional observations

Appendix D - Final Classification Rubric

Once pre-screening was completed, the design team examined each credential and its relationship to the International Standard Classification of Education (ISCED), The National Qualifications Framework (NQF), and the U.S. Department of Labor's Occupational Information Network (O*NET).

Full evaluations are available from the Classification Rubric: https://cdhe.colorado.gov/isced

Primary Resource	Link
ISCED Mappings	http://www.uis.unesco.org/Education/Pages/international-standard-classification-of-education.aspx
NQF Rubric (translate to English in Chrome)	Source: National Qualifications Framework for Vocational Education and Training Qualifications
O*Net Industries	https://www.onetonline.org/find/all
Credential Engine Credential Types	https://credreg.net/page/typeslist#:~:text=Higher%20Education%20Level%201%20Certificate,or%20occupational%20program%20of%20study.

Criteria	Response Choices
Credential Name	Name of Credential
Industry	Behavioral Health Cybersecurity Healthcare Software Development Education (ECE) other
Stackable Pathway (if applicable)	Social Work Addiction Counseling Info Sec (cert or apprenticeship) ECE (degree or apprenticeship) Emergency Medical Service Nursing Medical Technician Full Stack Developer Military to FE Developer Dev Ops.
Type of credential (certificate, license, NDC, apprenticeship, other)	Name of credential type
ISCED Level	1-8 or 'unable to determine
NQF Level	1-8 or 'unable to determine
O*NET Classification	Classification code and title (may be more than one)
Notes	Any additional observations