# CREDENTIAL INTEROPERABILITY

FY 2020 Education Stabilization Fund – Reimagine Workforce Preparation (ESF-RWP) Grants Program



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# CREDENTIAL INTEROPERABILITY

FY 2020 Education Stabilization Fund – Reimagine Workforce Preparation (ESF-RWP) Grants Program



#### Objectives

- ESF-RWP Program Requirement and Definitions
- Credential Interoperability
- Resources
- Questions and Answers

### PROGRAM REQUIREMENTS

Education Stabilization Fund – Reimagine Workforce Preparation (ESF-RWP)

Grant Program

#### Application and Information

*aration-grants* 

Federal Register Notice Inviting Applications (NIA): https://www.federalregister.gov/documents/2020/06/23/2020-13480/funding -opportunity-fy-2020-education-stabilization-fund-reimagine-workforce-prep

ESF-RWP Application Package Instructions: https://apply07.grants.gov/apply/opportunities/instructions/PKG00262274-in structions.pdf

Pre-applicant Webinar: https://s3.amazonaws.com/PCRN/webinars/ESF-RWP\_Pre-Application\_Webinar\_Slides\_062920.pdf

#### Background

The Department of Education wishes to ensure that individuals, employers, educators and training providers have access to the most complete, current and beneficial information about providers, programs and credentials supported with these grant funds.

#### **Absolute Priority 1**

- (a) Creating, developing, implementing, replicating, or taking to scale short-term educational programs and training courses or programs, and/or career pathways programs, including those focused on facilitating and strengthening entrepreneurship and small business ownership
- (b) Funding the creation, development, implementation, replication, or scaling of industry sector-based education and training models and programs

### Absolute Priority 1 (cont.)

Projects under Absolute Priority 1(a) and 1(b) may include apprenticeships and other work-based learning programs and must provide individuals the opportunity to earn badges, certifications, micro-credentials, licenses, or other credentials that employers affirmatively signal will contribute to qualifying a candidate for employment or promotion in an in-demand industry sector or occupation (as defined in this notice).

#### Program Requirement

Grantees must make information on all credentials (including badges, certificates, certifications, licenses, and degrees of all levels and types) and competencies (knowledge, skills and abilities) achieved as a result of funding under this program publicly accessible through the use of linked open data formats that support full transparency and interoperability.

Such information must include the industry sector for or by which the credential was developed, the entities involved in the development of the credential, the competencies or skills assessed in awarding the credential, the form of assessment used to verify an individual's eligibility to be awarded the credential, and the body engaged in overseeing the awarding of such credentials.

#### Program Requirement

Grantees must make information on all credentials (including badges, certificates, certifications, licenses, and degrees of all levels and types) and competencies (knowledge, skills and abilities) achieved as a result of funding under this program <u>publicly accessible</u> through the use of <u>linked open data formats</u> that support full <u>transparency</u> and <u>interoperability</u>.

Such information must include the <u>industry sector</u> for or by which the credential was developed, the <u>entities</u> involved in the development of the credential, the <u>competencies or skills</u> assessed in awarding the credential, the <u>form of assessment</u> used to verify an individual's eligibility to be awarded the credential, and the <u>body</u> engaged in overseeing the awarding of such credentials.

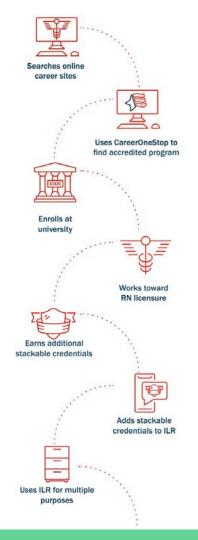
#### CREDENTIAL INTEROPERABILITY

Transparency and Interoperability of Credentials and Competencies

### Lifelong Learning and Employment



Image by mohamed Hassan from Pixabay



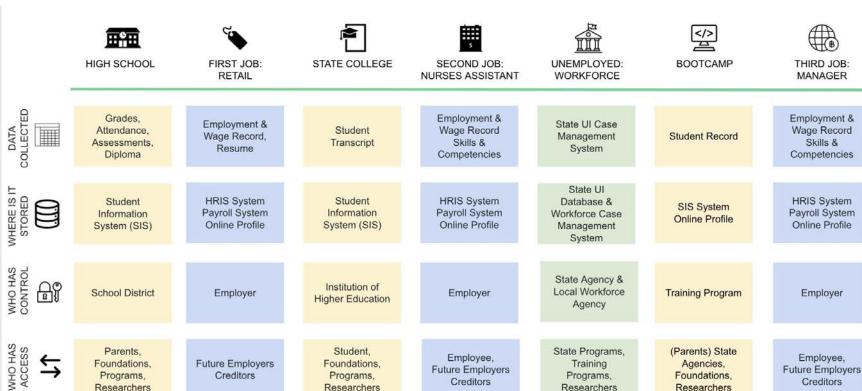
### Lifelong Learning and Employment



Image by mohamed Hassan from Pixabay



### Lifelong Data Silos



#### Credential Ecosystem

#### 738,438 Unique Credentials Offered

- → 370,020 by postsecondary institutions
- → 7,132 by MOOC providers

man-Capital-Benchmarking-Report.aspx

- → 315,067 by non-academic organizations
- → 46,209 by secondary schools

#### Source:

Counting US Postsecondary and Secondary Credentials https://credentialengine.org/wp-content/uploads/2019/09/Counting-US-Postsecondary-and-Secondary-Credentials\_190925\_FINAL.pdf

Society of Human Resource Management's 2016 Human Capital Benchmarking Survey https://www.shrm.org/about-shrm/press-room/press-releases/Pages/Hu

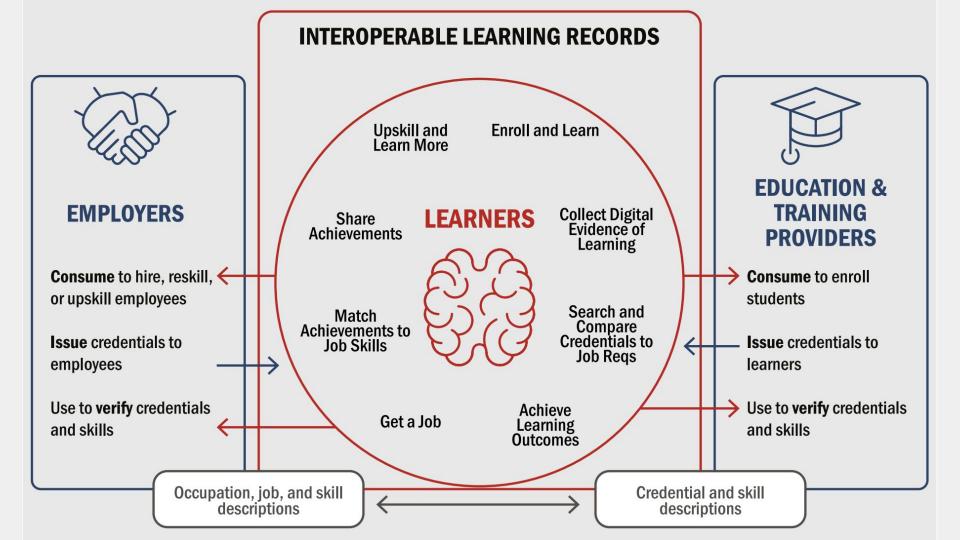
# AVERAGE TIME & COST PER HIRE



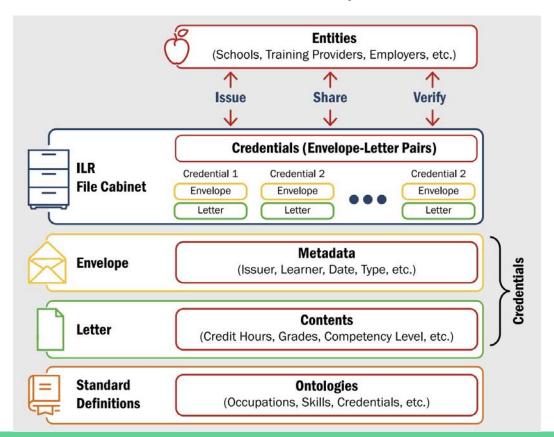
42 days



\$4,129



#### What makes a credential interoperable?



### Program Requirement

Grantees must make information on all credentials (including badges, certificates, certifications, licenses, and degrees of all levels and types) and competencies (knowledge, skills and abilities) achieved as a result of funding under this program <u>publicly accessible</u> through the use of <u>linked open data formats</u> that support full <u>transparency</u> and <u>interoperability</u>.

Such information must include the <u>industry sector</u> for or by which the credential was developed, the <u>entities</u> involved in the development of the credential, the <u>competencies or skills</u> assessed in awarding the credential, the <u>form of assessment</u> used to verify an individual's eligibility to be awarded the credential, and the <u>body</u> engaged in overseeing the awarding of such credentials.

#### Program Requirement

The Department requires that information about all credentials (including but not limited to badges, certificates, certifications, licenses, and degrees of all levels and types) and competencies (knowledge, skills and abilities) developed or delivered through the use of these Federal funds be made publicly accessible through the use of linked open data formats that support full transparency and interoperability, such as through the use of credential transparency description language specifications.

#### Concepts

- Publicly Accessible
- Linked Open Data Format
- Transparent
- Interoperable
- Credential Transparency Description Language (CTDL)

#### Publicly Accessible

Accessible: Open data are made available in convenient, modifiable, and open formats that can be retrieved, downloaded, indexed, and searched. Formats should be machine-readable (i.e., data are reasonably structured to allow automated processing). Open data structures do not discriminate against any person or group of persons and should be made available to the widest range of users for the widest range of purposes, often by providing the data in multiple formats for consumption. To the extent permitted by law, these formats should be non-proprietary, publicly available, and no restrictions should be placed upon their use."

Reference: https://policy.cio.gov/open-data/

#### Linked Open Data Format

Structured data is machine-readable and used by search engines to understand the content of web pages.

Linked Data is a type of structured data that links between systems via the Web. When data is both structured and linked, it becomes a powerful tool that search engines and other systems can leverage.

Linked Data is at the foundation of the Semantic Web, which is all about: (a) making meaningful links between data points understandable to humans and machines alike; and (b) providing the means for inferring new data from existing data.

Reference: https://policy.cio.gov/open-data/

#### Linked Open Data Format

Open Data is data that is both (1) Technically open: available in a machine-readable standard format, which means it can be retrieved and meaningfully processed by a computer application; and (2) Legally open: explicitly licensed in a way that permits commercial and non-commercial use and re-use without restrictions.

#### License Examples:

- Open Data Commons Open Database License (ODbL)
- Open Data Commons Attribution License
- Open Data Commons Public Domain Dedication and License (PDDL)

#### Linked Open Data Format

#### Data Format Examples:

- JSON-LD (https://www.w3.org/TR/json-ld11/)
- Microdata (https://www.w3.org/TR/microdata/)
- RDFa (https://www.w3.org/TR/rdfa-primer/)

#### Resource:

https://developers.google.com/search/docs/guides/intro-structured-data

#### Transparent

Clearly defined, enables comparison, and is based on shared open standards, common language/descriptions, and skills ontologies/frameworks. Provides contextual information for determining relevance and skills mastered.

#### Resource:

https://www.commerce.gov/sites/default/files/2019-09/ILR\_White\_Paper\_FINAL\_EB OOK.pdf

#### Interoperable

Uses open standards and common ontologies/frameworks to enable data to be machine readable, exchangeable, and actionable across technology systems and, when appropriate, on the Web. Supports combinations of data from multiple sources. Enables human interoperability and can be understood by people in different occupations and industries from diverse backgrounds.

#### Resource:

https://www.commerce.gov/sites/default/files/2019-09/ILR\_White\_Paper\_FINAL\_EB OOK.pdf

### Credential Transparency Description Language CTDL

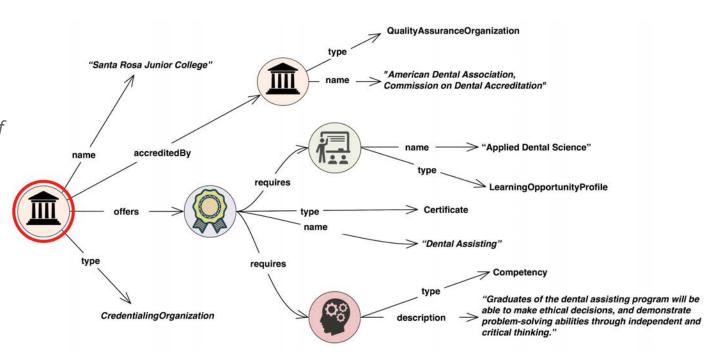
The Credential Engine's Credential Transparency Description Language (CTDL) is a set of terms and a logical grammar for using them, that is, a "schema" used to describe information regarding Credentials, Competency Frameworks, and Quality Assurance.

The CTDL is structured using RDF principles, allowing diverse systems to communicate about Credentials even if those systems use different schemas internally.

#### CTDL Linked Open Data Example

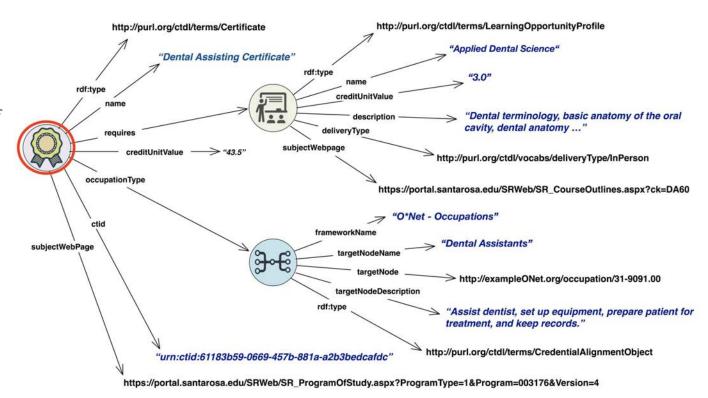
#### Santa Rosa College

offers a Certificate in
Dental Assisting that
requires completion of
their Applied Dental
Science program and
requires specific
competencies and is
accredited by the
American Dental
Association.



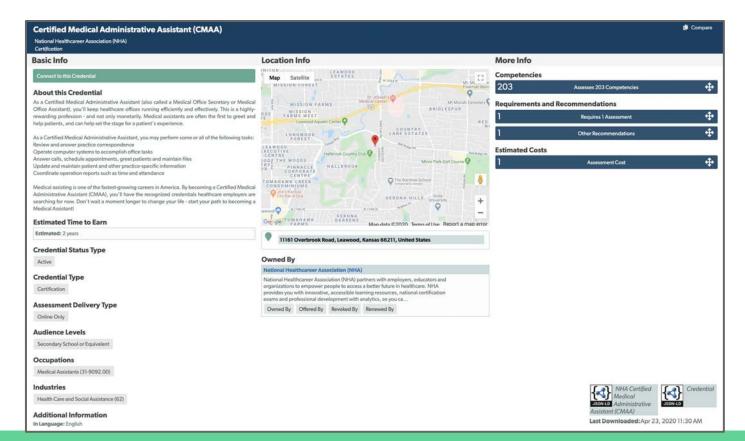
#### CTDL Linked Open Data Example

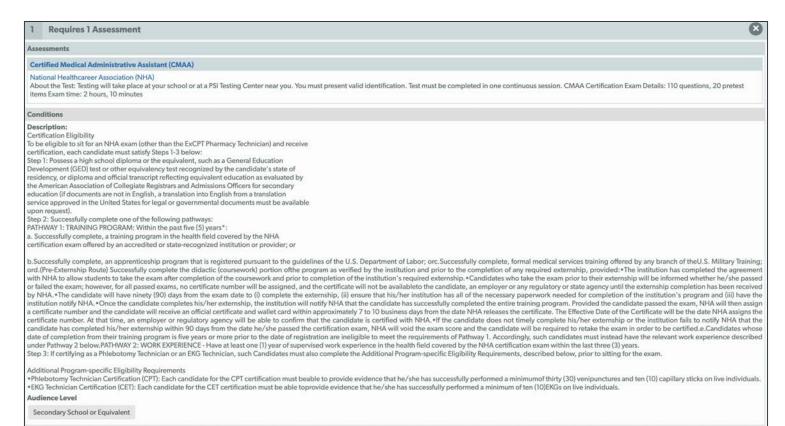
Santa Rosa College offers a **Certificate in Dental Assisting** that requires completion of their Applied Dental Science program and requires specific competencies and is accredited by the American Dental Association.

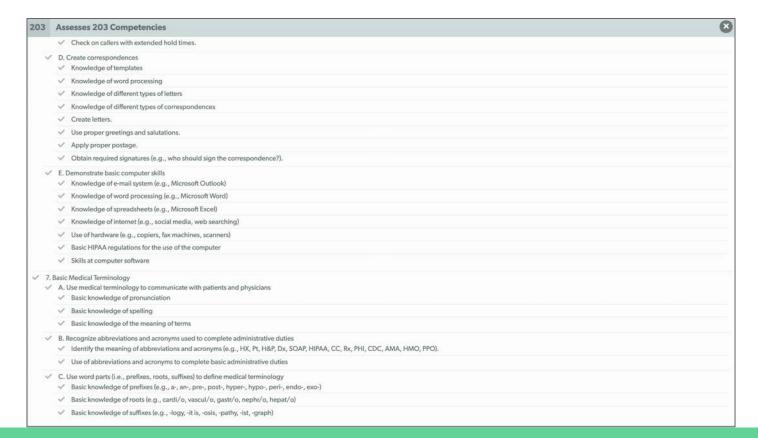


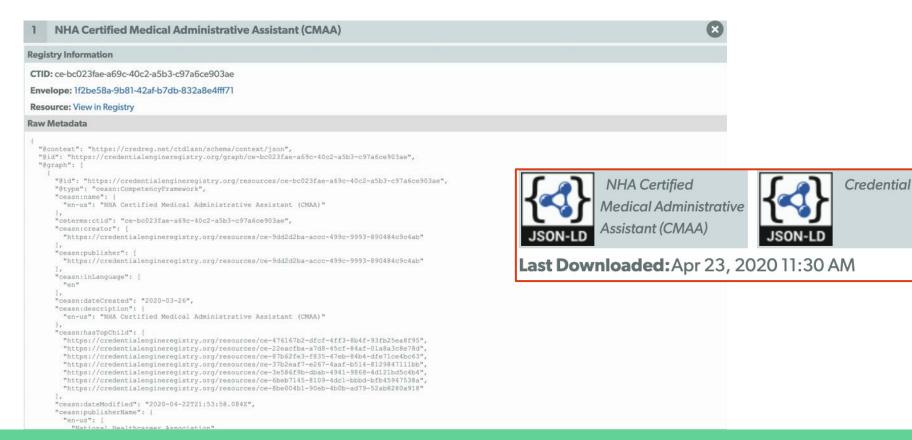
#### Required Data Elements

- Industry Sector
- Entities Developing Credentials
- Competencies/Skills Assessed
- Assessment
- Body Overseeing Award of Credential









#### **CTDL** Resources

Credential Engine is a non-profit organization that develops and maintains the Credential Transparency Description Language (CTDL) and scales and maintains a web-based Credential Registry that collects, connects, and maintains up-to-date credentialing data

#### Resources:

- https://credentialengine.org
- https://credentialengine.org/wp-content/uploads/2018/11/Linked\_Data\_Fact\_Sh eet.pdf
- https://credreg.net/quickstart/ilwrguide



#### Examples

Formats that support full transparency and interoperability of badges, certifications, micro-credentials, licenses, and others:

- ☐ W3C Verifiable Credentials Data Model https://www.w3.org/TR/vc-data-model
- Open Badge 2.0 Specification https://www.imsglobal.org/sites/default/files/Badges/OBv2p0Final/index.html
- Comprehensive Learner Record Specification https://www.imsglobal.org/activity/comprehensive-learner-record

### Examples

Data on industry sector, credential issuers/verifiers, competencies/skills, assessment

- US Department of Labor, Standard Occupational Classification https://www.bls.gov/soc/home.htm
- US Department of Labor, O\*NET https://www.onetonline.org/
- US Department of Labor, Competency Model Clearinghouse, https://www.careeronestop.org/CompetencyModel/

#### Examples

Data on industry sector, credential issuers/verifiers, competencies/skills, assessment (cont'd)

- EMSI Open Skills Library, https://skills.emsidata.com/
- HR Open Standards, https://hropenstandards.org/
- National Initiative for Cybersecurity Education (NICE), Cybersecurity Workforce Framework, https://www.nist.gov/itl/applied-cybersecurity/nice/nice-cybersecurity-workforce-framework-resource-center
- Competencies and Academic Exchange (CASE) Framework, https://casenetwork.imsglobal.org/cfdoc/

# **RESOURCES**

Interoperability and the "Learning and Employment Record"

#### White Paper on Interoperable Learning Records

AWPAB Data Transparency Working Group

https://www.commerce.gov/sites/default/files/201 9-09/ILR\_White\_Paper\_FINAL\_EBOOK.pdf



#### Interoperable Learning Records Landscape Inventory

AWPAB Data Transparency Working Group

https://www.commerce.gov/sites/default/files/2019-12/AWPAB\_ILR\_Inventory\_Nov2019.pdf



#### T3 Innovation Network

Learning and Employment Record (LER) Hub

https://lerhub.org/



# **QUESTIONS AND ANSWERS**

ESF-RWP@ed.gov



Does the requirement to use linked, open data formats prevent me from partnering with proprietary credential providers?

When should we start thinking about this program requirement?

Can we focus on course development first, and then worry about meeting this requirement after we have released the training program?

What if we are developing credentials that contain proprietary information, such as about the assessment or the competencies?

# **END**