



WEBINAR

Supporting the Learner throughout their Competency-Based Journey: Examining Tech Standards

November 17, 2020



A photograph of three students, two girls and one boy, looking at a tablet together. The image is overlaid with a blue gradient. The word "Welcome" is written in large white letters on the left side of the image.

Welcome

- **Introduce yourselves in the chat box.**
 - Share who you are, where you are from, and one hope you have for this school year.
- **Ask and answer questions.**
 - Use the chat function to pose questions of our panelists. Attendees are also encouraged to respond.
- **Share your learning.**
 - Tell your colleagues what you are learning. Use #Aurora2020 on Twitter and mention @Aurora_Inst.
- **We are recording and archiving the webinar.**
 - The slides and video will be available on aurora-institute.org.

Supporting the Learner Throughout their Competency-Based Journey

Aurora Institute

17 November 2020

Michael Jay, Jeanne Kitchens, Brandt Redd



Outline

- **Competency Frameworks and Competency-Based Learning**
 - Michael Jay, CTO, MatchMaker Education Labs, PBC
- **Credentials and Interoperable Learner Records**
 - Jeanne Kitchens, Chief Technology Services Officer, Credential Engine
- **Data Standards and Interoperability**
 - Brandt Redd, CTO, Matchmaker Education Labs, PBC
- **Questions and Answers**

Competency Frameworks and Competency-Based Learning

Michael Jay

Before the pandemic



Now



It was so much easier when...



Evolution of guiding documents...

Educator

↳ Textbook

↳ Curriculum

↳ Frameworks

↳ Standards

↳ Competencies

Competency vs. Standard

Standards describe what learners should know and be able to do in relation to an established criteria.

Competencies describe how students apply and transfer their learning to new contexts and situations.

Std: Be able to accurately read an analog thermometer

Std: Be able to calculate humidity using wet bulb & dry bulb thermometers

Comp: Collect data using instruments to describe atmospheric conditions and predict weather

The good stuff we got from NCLB

From Curriculum Standards to Technical Standards:

Data Pipes

Parsing of statements

Drive to reference-ability

Goal of interoperability

The catch... measurement

What does it mean to have achieved a competency?

Competencies are comprised of multiple skills.

Skills are almost always be easier to measure.

Competencies lend themselves to:

hybrid assessment

personal artifacts of understanding

multiple contexts and applications of knowledge

Ownership and context

Communities define themselves by their shared beliefs and priorities

Learning communities do the same.

Example: Common Core

Conceptually good... missed social components

85% common with 15% local

Constructivist approach - Students & Educators

Utah's Vision (Todd Call, 2020 SETDA Leadership Symposium)

Utah's Portrait of a Graduate identifies the **ideal characteristics** of a Utah graduate after going through the K-12 system. These are **aspirations** not necessarily meant to be quantified and measured. These characteristics **begin at home** and are **cultivated in educational settings.**

Mastery

Autonomy

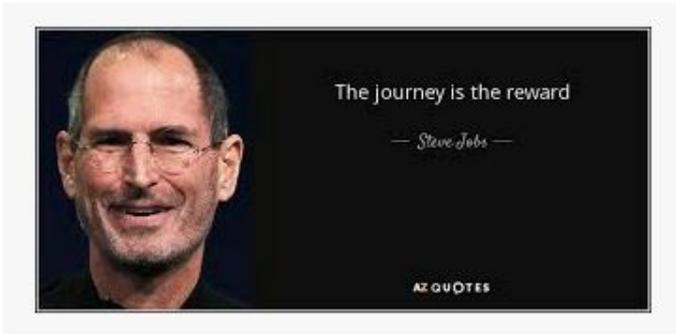
Purpose





The journey is the reward | The journey is the reward | Journey ... the journey is the reward | J... Chinese proverb - The journey is the ...
zerodean.com pintrest.com pinter.com quotesnsaying.net

A Modern Definition of Truth



Steve Jobs quote: The journey is the reward
azquotes.com



The journey is the reward.* - Steve Jobs
startupquotes.startupvitamins.com



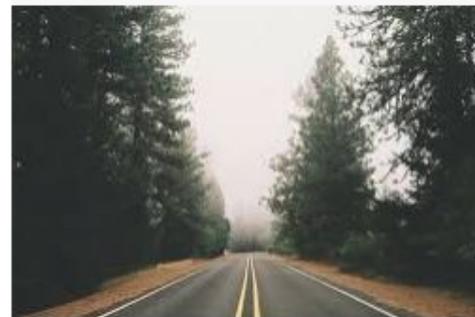
The journey is the reward | Rockebah C ...
rockebahcstewart.com



the journey is the reward - Will Rosen...
willrosenberg.com



Dale Dauten Quote: "One path is greed ...
quotefancy.com



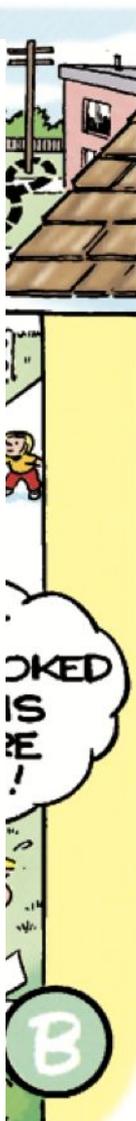
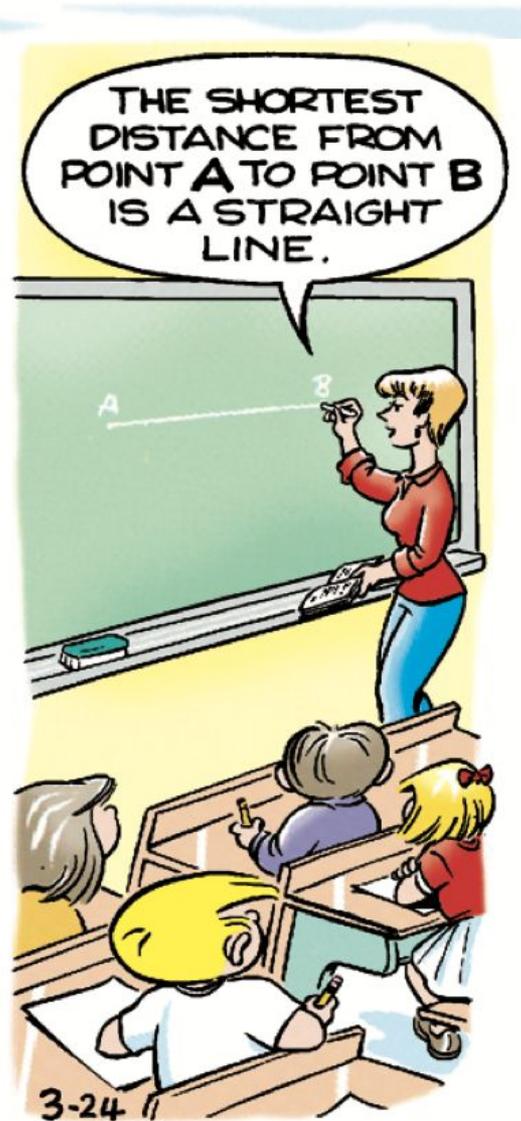
3 Reasons Why 'The Journey Is the Reward'
entrepreneur.com



The journey is the rewa...
picturequotes.com

THE FAMILY CIRCUS[®]

By **BIL KEANE**



KEANE

De-Babelization

While we support localization, we also need to map
Do what I mean, not what I say!

Have you *read* 'the' standards or competencies?

Meant to be implementable but they are still
politically and socially
constructed.

We need ways to mediate
between competencies



THE TOWER OF BABEL, PIETER BRUEGEL, 1563

MatchMaker Education Labs

We provide technologies and tools that match:

Competencies to competencies

Competencies to standards

Competencies to learning resources

Competencies to curriculum

Competencies to skills

... and much more!

We liberate learning.

Credentials and Interoperable Learner Records

Jeanne Kitchens, Credential Engine CTSO



It can be so much easier ...



About Credential Engine

Our Mission: Credential Engine is a non-profit whose mission is to create credential transparency, reveal the credential marketplace, increase credential literacy, and empower everyone to make more informed decisions about credentials and their value.

How we accomplish our mission:

- Building common infrastructure and language
- Collaboration
- Empowerment



Credential
Engine™

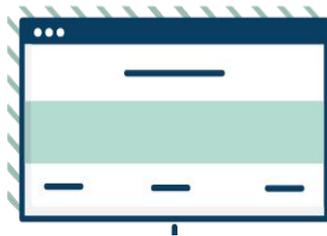
Credential Engine Technologies

Community – A wide range of stakeholders provide and receive technical assistance and other services to both publish to the Registry and consume the data it houses. *Credentialing bodies, developers, and other users have access to resources such as do-it-yourself guides, best practices, and technical support.*



Credential Transparency Description Language (CTDL) – Common language that describes key features of credentials, credentialing organizations, competency frameworks, quality assurance bodies, and more.

Common descriptors allow for better comparison between credentials.



Publishing – After creating a user account, organizations use the API or any of the Publishing System tools to convert information to CTDL and publish to the Registry

Organizations have a suite of options to add information to the Credential Registry.



Credential Registry – More than a database, the Registry collects and connects credential data described with CTDL and supports an open applications marketplace

Developers can create specialized applications to utilize Registry data for different types of audiences, such as employers, veterans, and learners.

CREDENTIAL FINDER

Credential Finder – A basic app to view and explore the information stored in the Registry.

The public can use the Finder to see all information published to the Credential Registry.



The Education and Workforce Marketplace is Complex



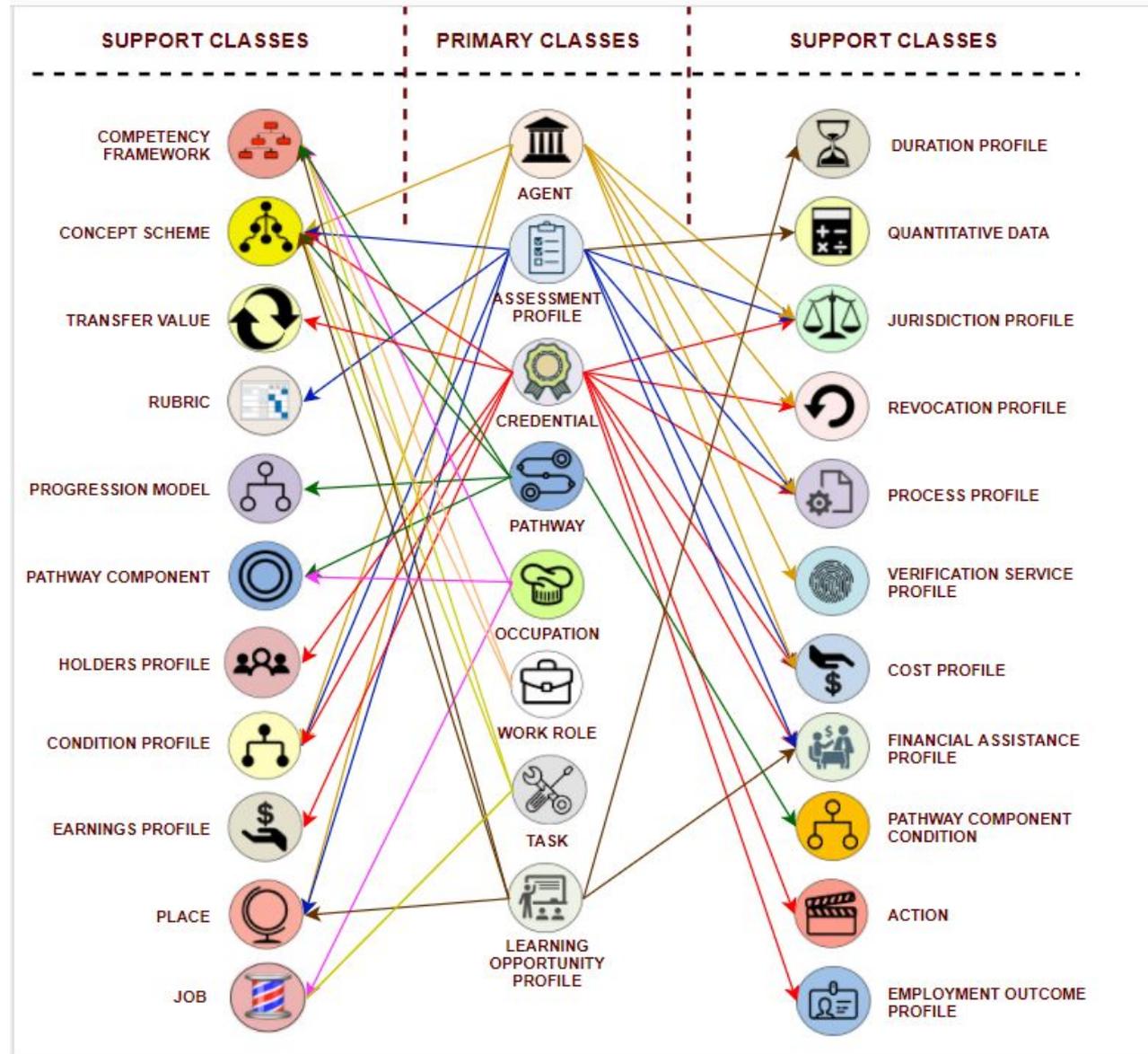
- 738,000+ credentials offered in the U.S. across different types of credentials and providers
- Educators, policymakers, employers, and the general public struggle to evaluate the meaning of credentials and competencies, including:
 - learning outcomes they represent
 - quality processes
 - connections to other opportunities whether additional credentials or jobs



Credential Transparency Description Language (CTDL)

A common language for transparency and comparability of credential and competency information.

<https://credreg.net>



Credential Registry

Based on CTDL, uses linked open data to provide credential and competency data. CTIDs are unique identifiers that work like a product ID.



The Credential Registry is not for issuing credentials or for personally identifiable information about people.

Credential Finder

See all of the information using the Credential Transparency Description Language in the Credential Registry.

<https://credentialfinder.org>

The screenshot displays the Credential Finder interface. At the top, it says "CREDENTIAL FINDER™ Discover Credentials Powered by Credential Registry". A search bar contains "Credentials" and a search button. Below the search bar, it indicates "Found 19539 results". The results are listed in a grid format, each with a credential icon, title, issuer, and a brief description. The first result is "PRACTICAL NURSING - CERTIFICATE" by Pratt Community College. The second is "ELECTRICAL TECHNOLOGY - ASSOCIATE OF APPLIED SCIENCE" by Coffeyville Community College. The third is "HBAA Residential Construction Skills Certification" by Home Builders Association of Alabama. The fourth is "B.S. in Applied Management and Leadership" by American College of Education. Each result includes a "Compare" button and a list of attributes like Quality Assurance, Audience Level, Occupations, Instructional Program Type, and Time Estimate.

CREDENTIAL FINDER™ Discover Credentials Powered by Credential Registry

Search About Admin Jeanne Kitchens

Search For
Credentials Start typing to search... Search Filters

Found 19539 results Download Report Show/Hide Descriptions Show/Hide Gray Buttons Sort by Most Rec... List Map

1 PRACTICAL NURSING - CERTIFICATE
ce-a33d3734-3716-3785-d9e7-c90c645a3f3d
Pratt Community College
One-year Technical Certificate : A program that prepares individuals to assist in providing general nursing care under the direction of a registered nurse, physician or dentist. Includes instruction in taking patient vital signs, applying sterile dressings, patient health education, and assistance with examinations and treatment.
Certificate
1
1 Quality Assurance > 1 Audience Level > 1 Occupation > 1 Instructional Program Type > 1 Time Estimate >
Last Updated: 11/14/2020
Created: 7/16/2019

2 ELECTRICAL TECHNOLOGY - ASSOCIATE OF APPLIED SCIENCE
ce-bf167931-6472-2b5e-c6b7-42150ea904b
Coffeyville Community College
Associate Degree : A program that prepares individuals to apply technical knowledge and skills to install, operate, maintain, and repair electric apparatus and systems such as residential, commercial, and industrial electric-power wiring; and DC and AC motors, controls, and electrical distribution panels. Includes instruction in the principles of electronics and electrical systems, wiring, power transmission, safety, industrial and household appliances, job estimation, electrical testing and inspection, and applicable codes and standards.
Associate's Degree
2
1 Quality Assurance > 1 Audience Level > 4 Occupations > 1 Instructional Program Type > 1 Time Estimate >
Last Updated: 11/13/2020
Created: 7/16/2019

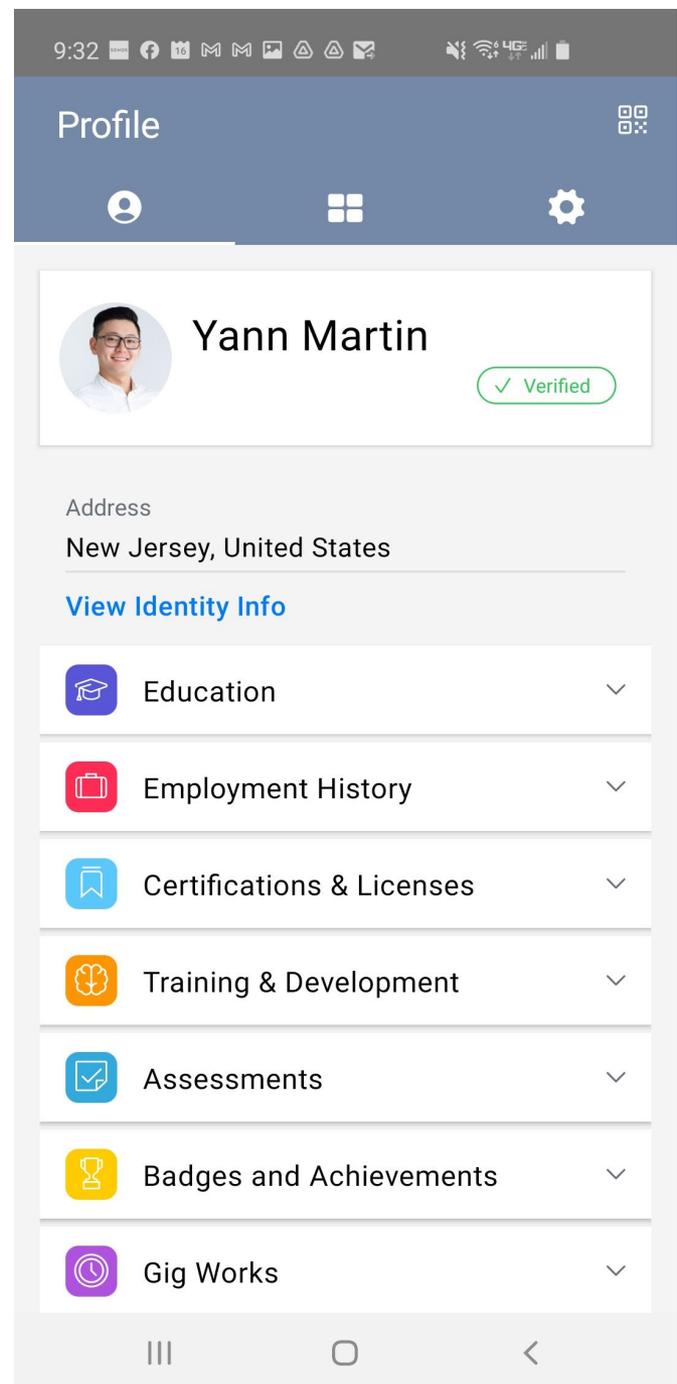
3 HBAA Residential Construction Skills Certification
ce-78c15a22-d08d-4f22-e005-2519724d15cc
Home Builders Association of Alabama
The Home Builders Association of Alabama (HBAA) Residential Construction Skills Certification validates an individual's knowledge and skills of residential construction principles and practices. The certification verifies an individual possesses fundamental competencies necessary to be a productive worker on a residential construction job site. Those who earn the certification are more qualified and prepared to enter high-demand roles within the construction industry.
Certification
3
6 Audience Levels > 29 Occupations > 39 Industries > 1 Assessment Delivery Type > 1 Learning Delivery Type >
Last Updated: 11/12/2020
Created: 11/12/2020

4 B.S. in Applied Management and Leadership
ce-9a10d176-c18d-444f-abe7-17850c8c82b2
American College of Education
The Bachelor of Science in Applied Management and Leadership program is built to provide students with the knowledge and skills to become and advance as managers and leaders within their respective fields. Graduates of the program will be able to decipher financial statements and make decisions about future business performance. They will develop, prepare, and manage marketing strategies taking consumer data into discussion. Those who earn the degree will also determine ways to organize and lead many aspects of a variety of projects.
Bachelor's Degree
4
1 Audience Level > 1 Instructional Program Type > 1 Assessment Delivery Type > 1 Learning Delivery Type > 1 Estimated Cost >
Last Updated: 11/12/2020
Created: 11/12/2020

Learning and Employment Records (LER) Example

An LER is a digital record of learning that can document learning wherever it occurs, including at the workplace, through an education program/experience, through community activities, and/or through military training.

The design and format of the CTDL and Credential Registry are compatible with LERs.





Yann Martin's User Story Example from the Velocity Network Foundation

Yann is a Registered Nurse (RN) working in a New Jersey hospital. He holds a BSN degree from the Starfield College, NJ. After getting married he and his partner decide to move to Florida. He is looking for a job in a hospital near their new FL home.

In order to be licensed in Florida Yann must provide verification of his degree and NJ License. He downloads the Velocity wallet to his cell phone and verifies his identity. He then collects his BSN degree from his college and his RN license from the NJ board.

Yann uses Velocity to share his license as well as his BSN degree while applying for a license-by-endorsement through the Florida Nursing degree Board of Nursing website. The FL board then verifies his license.

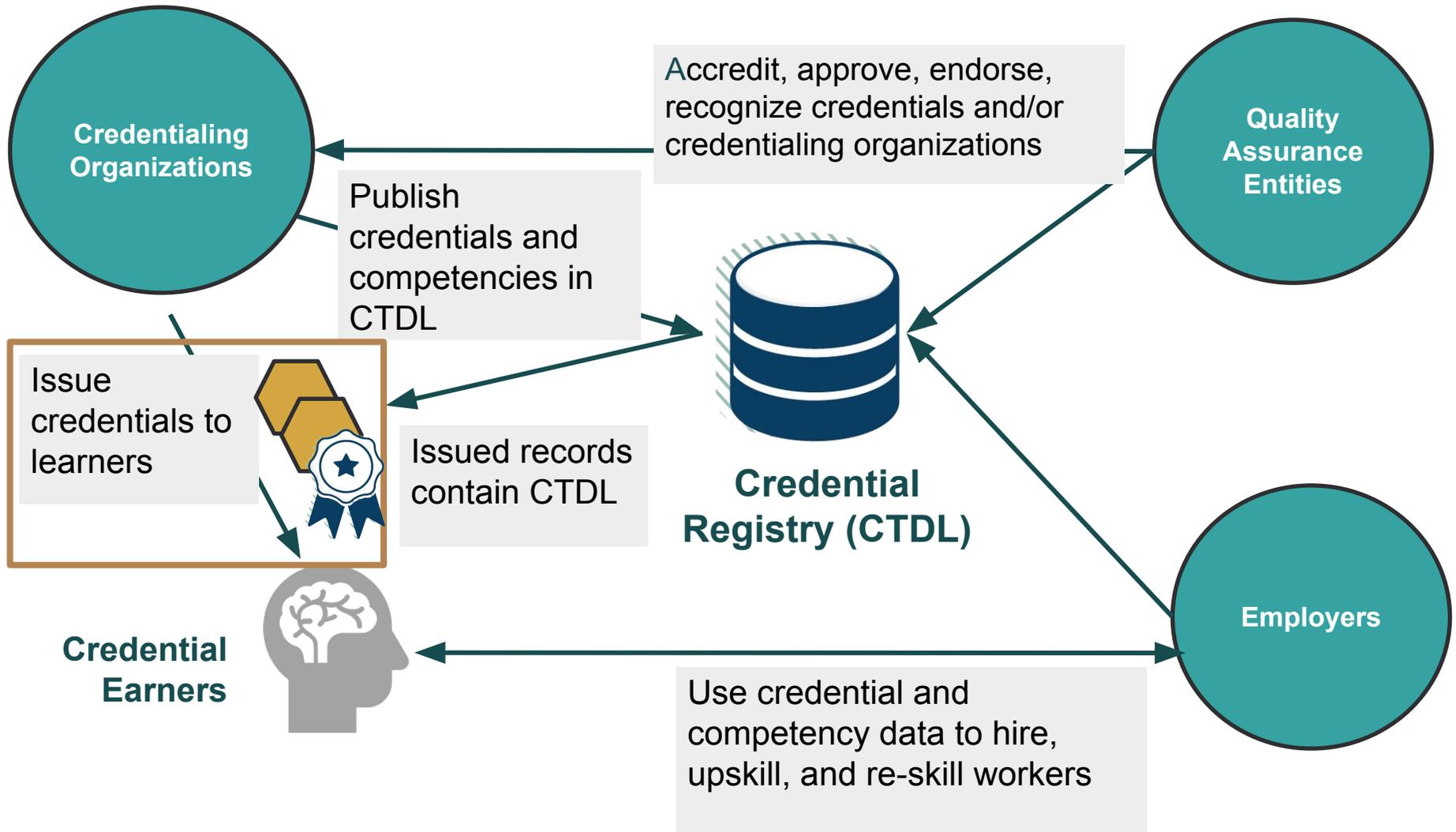
After some job searching, he comes across an interesting LPN job offer in a local long term care center, the Autumn Leaves Care Center. During his BSN studies he had taken two courses in gerontology although eventually he did not pursue Long Term Care as a specialty. He decides to share the course completion certificates, hoping it will help him get the job. Yann is accepted to work on the condition that he completes studies towards a Gerontological Nursing Certification.

He applies for a tuition reimbursement program within the Autumn Leaves Care Center.

Yann enrolls to a training program that is aimed at preparing for the Gerontological Nursing Certification RN-BC exam. To meet the requirements of the tuition reimbursement program he needs to verify not only that he completed the training but also that he had started it. After having completed 2,000 hours of clinical practice in the center he receives a badge and after having completed the training too, Yann is ready to take the exam. He passes the exam and receives his certification from the Accreditation Board for Specialty Nursing Certification of the ANCC (American Nursing Credentialing Center) which he gladly shares with the Autumn Leaves Care Center.

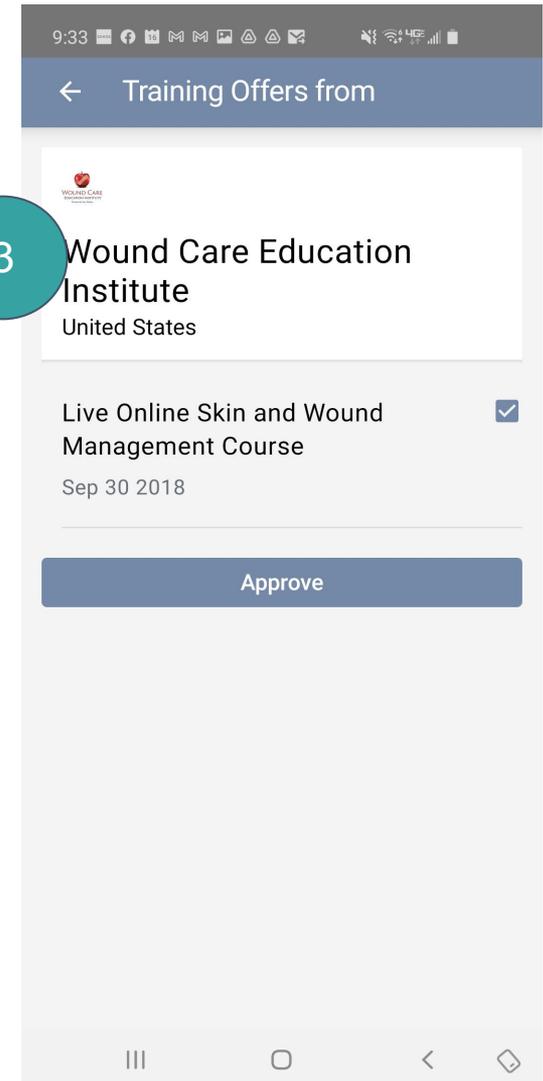
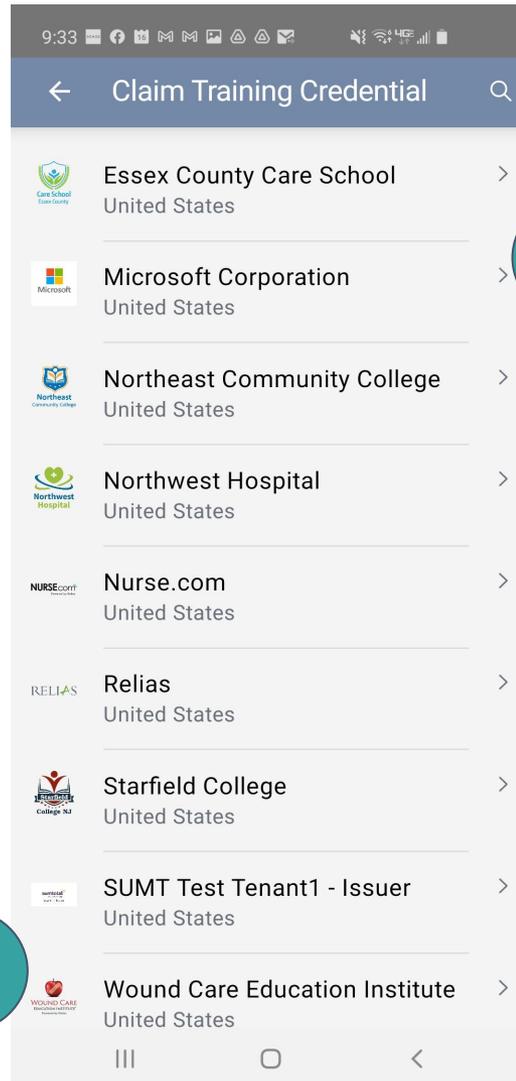
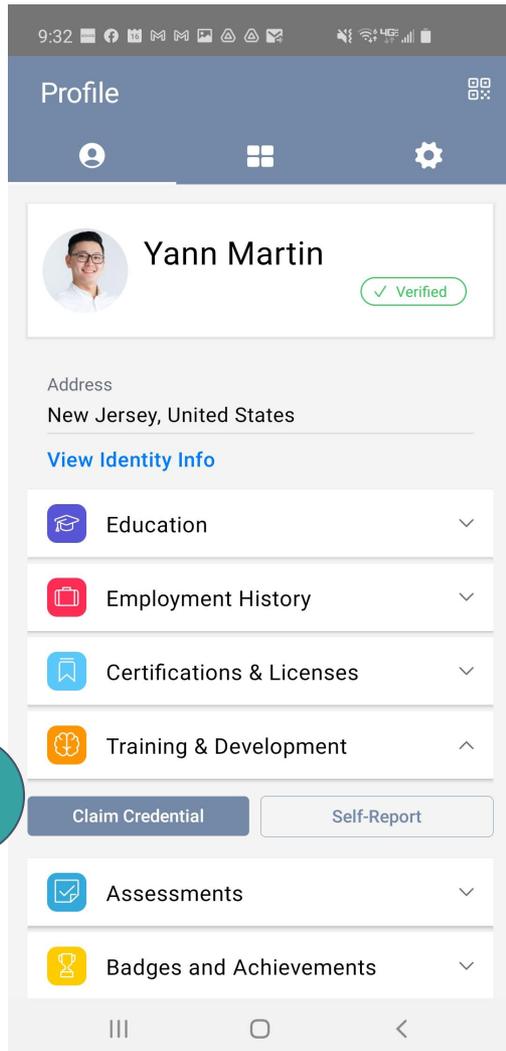
Credential and Competency Ecosystems

This diagram shows how the Credential Transparency Description Language (CTDL) and Credential Registry enhance LERs.



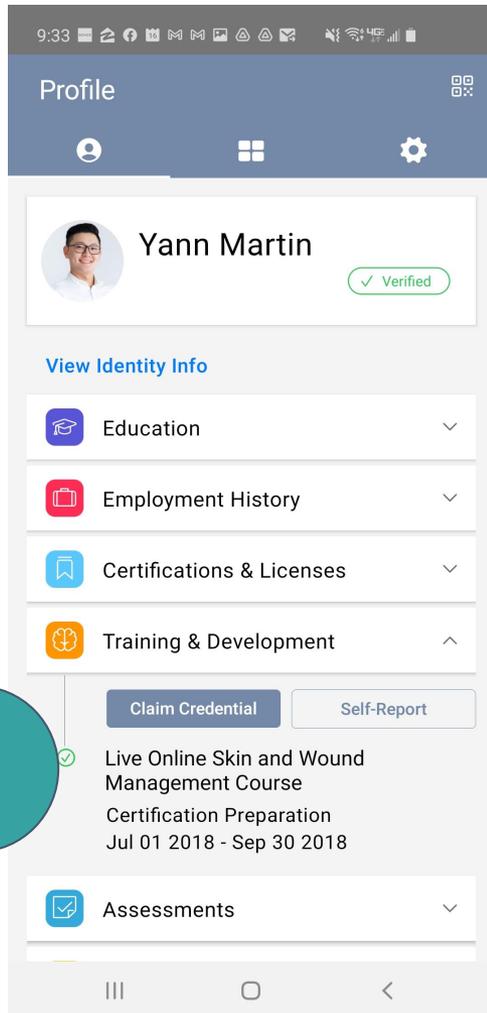
LER Using CTDL Example

Velocity Network Foundation is piloting LERs. This is an example of an LER.

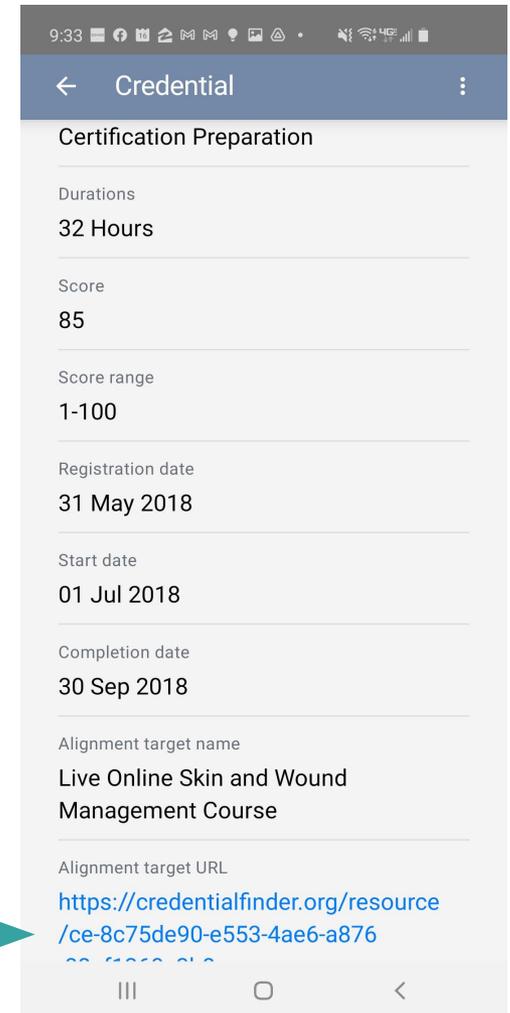
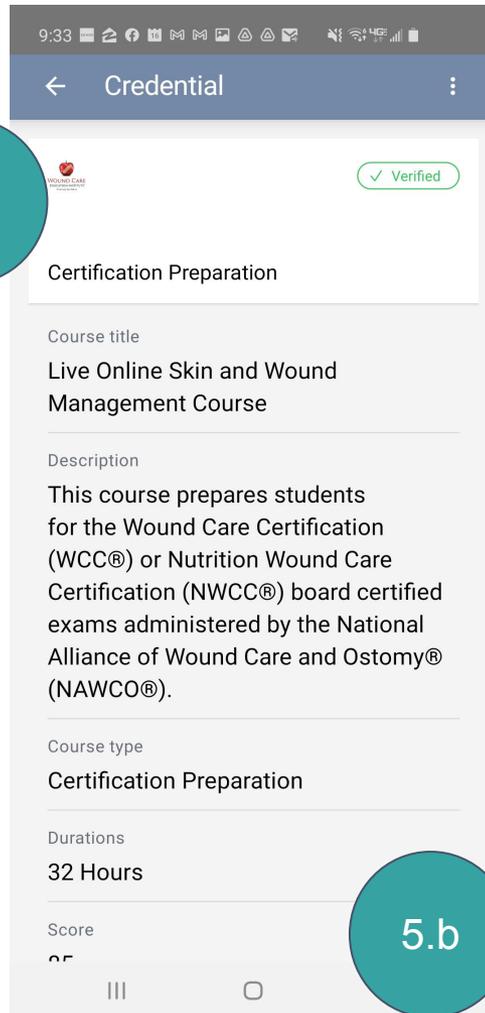


LER Using CTDL Example

Yann used the app to claim his verified credential that he can now share.



5.a



LER Using CTDL Example

Yanni's verified credential links to information about it In the Credential Finder.

6.a

The screenshot displays the 'Live Online Skin and Wound Management Course' page on the Credential Finder website. The page is organized into several sections:

- Header:** 'CREDENTIAL FINDER' logo with the tagline 'Discover Credentials Powered by Credential Registry'. Search and About links are in the top right.
- Course Title:** 'Live Online Skin and Wound Management Course' with a 'Compare' button.
- Provider:** 'Relias Certificate of Completion'.
- Basic Info:** Includes a 'Connect to this Credential' button, 'About this Credential' (describing the evidence-based approach), 'Credentia Status Type' (Active), 'Credentia Type' (Certificate of Completion), and 'Additional Information' (In Language: English).
- Location Info:** 'Owned By' section for 'Relias', with a description of their mission and an 'Owned By' button.
- More Info:** 'Competencies' (18, Teaches 18 Competencies) and 'Requirements and Recommendations' (1, Requires 1 Learning Opportunity).
- Footer:** Summary statistics (0 Credentials, 0 Organizations, 0 Assessments, 0 Learning Opportunities), 'Expand/Hide Details', 'Compare Selected', and a trash icon.

At the bottom right, there are two JSON-LD icons: one for 'Live Online Skin and Wound Management Course Learning Objectives' and another for 'Credential'. The page was last updated on Nov 10, 2020 at 2:15 PM.

LER Using CTDL Example

This credential includes the competencies earned.

The screenshot displays the 'Credential Finder' website interface. At the top, it says 'Discover Credentials Powered by Credential Registry'. The main content area is titled '18 Teaches 18 Competencies' and lists 'Live Online Skin and Wound Management Course Learning Objectives'. Below this, a 'Details' button is visible. The 'Competencies' section contains a list of 18 items, each with a checkmark icon. A teal circle with the text '6.b' is overlaid on the top right of the page. The bottom of the page features a navigation bar with 'Assessments' and 'Learning Opportunities'.

18 Teaches 18 Competencies

Live Online Skin and Wound Management Course Learning Objectives

Participants in this course will achieve these Learning Objectives.

Details

Competencies

- ✓ Discuss how standards of care, evidence-based practice and a multidisciplinary wound care team can affect clinical choices in wound management.
- ✓ Discuss the basic anatomy and physiology of the skin.
- ✓ Identify at least five parameters required for accurate wound assessment.
- ✓ Identify pressure ulcer stages according to NPUAP guidelines.
- ✓ Identify five factors which enhance or impede the wound healing process.
- ✓ Explain four types of basic principles of wound bed preparation.
- ✓ Identify three major components of a nutritional assessment for optimizing wound healing.
- ✓ Identify four different categories for topical wound management.
- ✓ Select treatment options based upon wound assessment, etiology and goal of wound care.
- ✓ Differentiate arterial, neuropathic and venous ulcers in terms of causative factors, pathophysiology, appearance and principles of management.
- ✓ Describe three factors involved in development of a pressure ulcer and interventions to prevent their occurrence.
- ✓ Describe at least five interventions that optimize acute surgical wound healing.
- ✓ Differentiate between wound etiologies and clinical manifestations of acute and traumatic wounds.
- ✓ Differentiate types of burns and principles of management.
- ✓ Select treatment options, and differentiate between wound etiologies and clinical manifestations of chronic, malignant and inflammatory wounds.
- ✓ Discuss three adjunctive treatment modalities that enhance wound healing.
- ✓ Discuss current multidisciplinary care approaches to wound care.
- ✓ Discuss components required for accurate wound documentation.

LER Using CTDL Example

At the bottom, right corner of the page about the Credential, click to see what the data looks like in the Credential Registry.

The screenshot displays a web interface for a Credential Registry. On the left, a modal window titled "Registry Info" is open, showing the following details:

- Registry Information**
 - CTID: ce-8c75de90-e553-4ae6-a876-08ef1360c3b8
 - Envelope: 55a677ce-9936-40d7-a8c5-b49d3ae9b439
 - Resource: [View in Registry](#)
- Raw Metadata**

```
{
  "@context": "https://credreg.net/ctdl/schema/context/json",
  "@id": "https://credentialengine registry.org/graph/ce-8c75de90-e553-4ae6-a876-08ef1360c3b8",
  "@graph": [
    {
      "@id": "https://credentialengine registry.org/resources/ce-8c75de90-e553-4ae6-a876-08ef1360c3b8",
      "@type": "ceterms:CertificateOfCompletion",
      "ceterms:ctId": "ce-8c75de90-e553-4ae6-a876-08ef1360c3b8",
      "ceterms:name": {
        "en-US": "Live Online Skin and Wound Management Course"
      },
      "ceterms:ownedBy": [
        "https://credentialengine registry.org/resources/ce-a89d9e3b-879c-4fbb-9cb9-8b0bdfc540eb"
      ],
      "ceterms:requires": [
        {
          "@type": "ceterms:ConditionProfile",
          "ceterms:name": {
            "en-US": "Live Online Skin and Wound Management Course"
          },
          "ceterms:assertedBy": [
            "https://credentialengine registry.org/resources/ce-a89d9e3b-879c-4fbb-9cb9-8b0bdfc540eb"
          ],
          "ceterms:description": {
            "en-US": "This Certificate of Completion is based on the Live Online Skin and Wound Management Course."
          },
          "ceterms:targetLearningOpportunity": [
            "https://credentialengine registry.org/resources/ce-fd546816-9bb2-401e-bae1-69431411e433"
          ]
        }
      ],
      "ceterms:inLanguage": [
        "en"
      ],
      "ceterms:description": {
        "en-US": "This course offers an evidence-based approach to wound management to help clinicians stay current with the standards of care and legally defensible at bedside. The Wound Care Education Institute® (WCEI®) provides dynamic instructors who use engaging teaching methods proven to help students learn better and retain new material. \n\nThis course prepares students for the Wound Care Certification (WCC®) or Nutrition Wound Care Certification (NMCC®) board certified exams administered by the National Alliance of Wound Care and Ostomy® (NAWCO®)."
      },
      "ceterms:subjectWebpage": "https://www.wcei.net/courses/skin-wound-management/live-online-course",
      "ceterms:credentialStatusType": {
        "@type": "ceterms:CredentialAlignmentObject",
        "ceterms:framework": "https://credreg.net/ctdl/terms/CredentialStatus",
        "ceterms:targetNode": "credentialStat:Active",
        "ceterms:frameworkName": {
          "en-US": "CredentialStatus"
        },
        "ceterms:targetNodeName": {
          "en-US": "Active"
        }
      }
    }
  ]
}
```

On the right, the main page shows a search bar, a "Compare" button, and sections for "Info", "Competencies" (Teaches 18 Competencies), and "Requirements and Recommendations" (Requires 1 Learning Opportunity). At the bottom right, a teal circle with the number "6." and the letter "C" has an arrow pointing to a credential card for "Live Online Skin and Wound Management Course Learning Objectives". The card includes a "JSON-LD" icon and a "Credential" icon. Below the card, it says "Last Updated: Nov 10, 2020 2:15 PM".

At the bottom of the interface, there is a navigation bar with the following items:

- 0 Credentials
- 0 Organizations
- 0 Assessments
- 0 Learning Opportunities
- Expand/Hide Details
- Compare Selected
- Trash icon

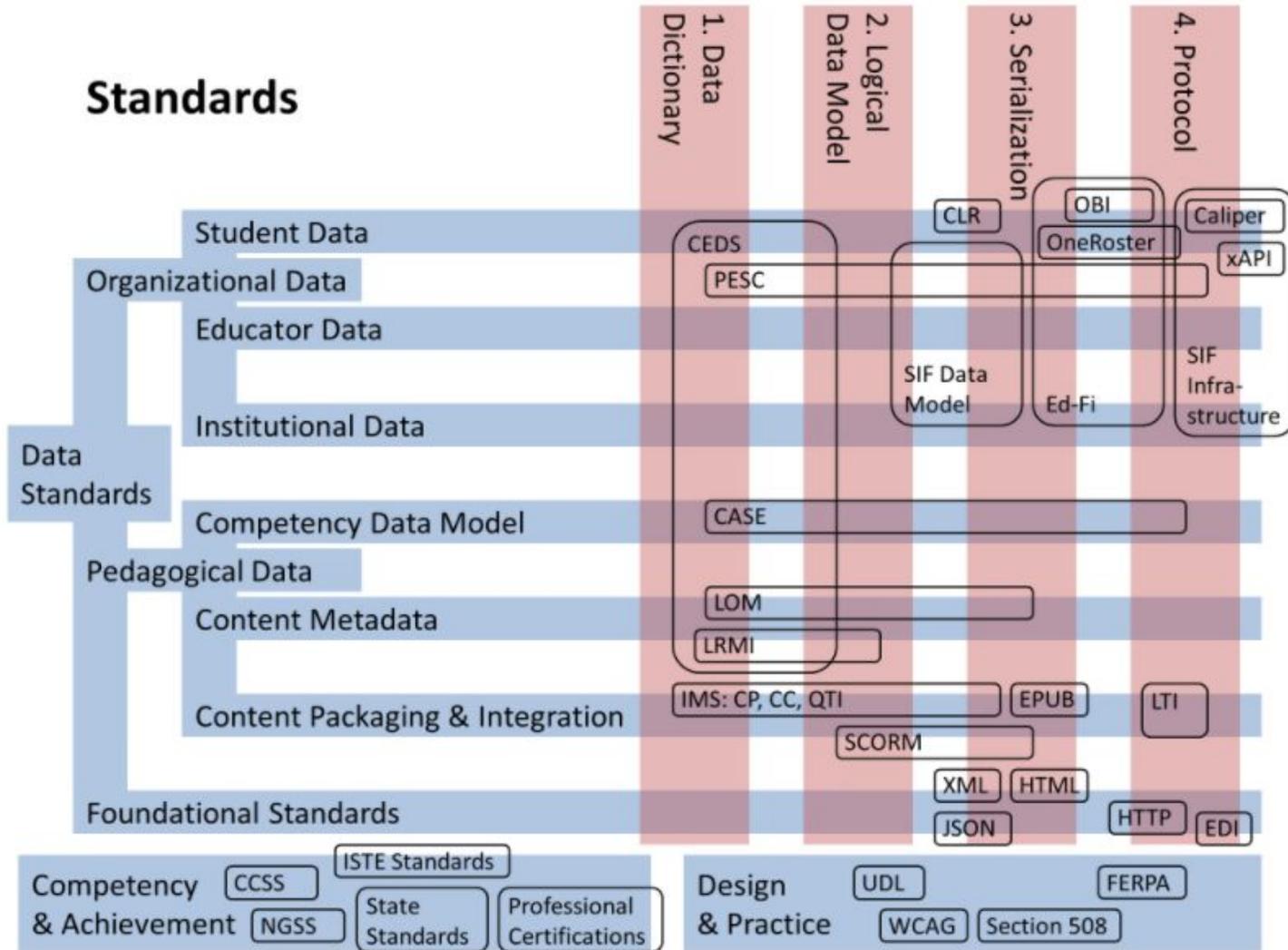
How You Can Participate

- Subscribe to Credential Engine News and Follow on Social Media <https://credentialengine.org/subscribe/>
- Explore credential and competency information published to the Credential Registry via the Credential Finder <https://credentialfinder.org>
- Learn more about Credential Engine's open services <https://credentialengine.org/services/>
- Create a free Credential Engine account to publish credential and competency information to the Registry <https://apps.credentialengine.org/accounts/Account/Login>
- Learn more about LERs and join and LER Pilot <https://lerhub.org/home/dashboard>
- Learn about the Credential Engine's technologies and CTDL <https://credreg.net>
- Dig deeper to understand how CTDL and Credential Registry support LERs <https://credreg.net/quickstart/ilwrguide>
- Learn more about Velocity Foundation <https://www.velocitynetwork.foundation/>

Data Standards and Interoperability

Brandt Redd, CTO, MatchMaker Education Labs





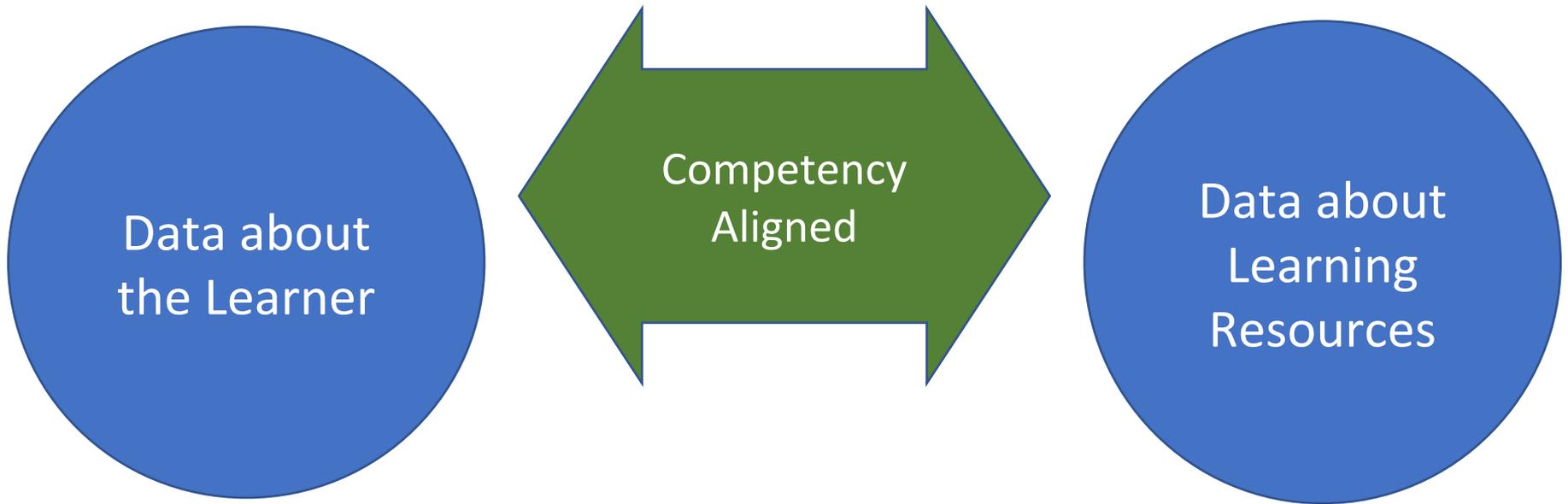
Progress

- **1984:** Bloom's Two Sigma Problem: Benjamin Bloom shows that individual tutoring combined with Mastery-Based Learning results in 2 standard deviations better learning.
- **1997:** Western Governors University formed with an emphasis on competency-based learning in higher education.
- **2000:** No Child Left Behind causes states to write competency standards for K-12 education.
- **2010:** Common Core State Standards offer some degree of correlation between state standards.
- **2011:** Kurt VanLehn (ASU) revisits the Two Sigma Problem comparing intelligent tutoring systems with human tutoring. He finds similar achievement levels when mastery thresholds are matched.
- **2012:** iNACOL (now Aurora) launches CompetencyWorks.
- **2019:** iNACOL changes its name to the Aurora Institute as its research has catalyzed an emphasis on student-centered and competency-based learning.
- **2020:** Competency-Based Learning gains new attention under the unique challenges of COVID-19.

Competency Scenarios

- As a USAF Medic, what does Mary need to earn an EMT certification in IOWA?
- Gregoire has been studying quadratic equations. How does he know if he has mastered the topic?
- What competencies must be addressed in a new learning product?
- The entire class failed the unit test, what Learning Resources are best to remediate?
- Joe studied at the University of Utah, now he's transferring to the University of Virginia. What courses or competencies transfer?
- Is there a more appropriate learning resource for a learner that loves aerospace examples?

Personalized, Competency-Based Learning happens at the Intersection



Learners, teachers, and AI make well-informed decisions about learning when data are aligned.

To Support Competency-Based Learning...

- Data about the Learner
- Data about Learning Resources
- Data about Competency Frameworks

Data About the Learner

- ILR: Interoperable/Integrated/Independent Learner Record - LER: Learning and Employment Record

- IEEE LTSC P1484-2 Integrated Learner Record
<https://sagroups.ieee.org/1484-2/>



- CLR: Comprehensive Learner Record

- IMS Global and AACRAO

<https://www.msglobal.org/activity/comprehensive-learner-record>



- Access 4 Learning: SIF Data Model

- <https://www.a4l.org/page/SIFSpecifications>



- Common Education Data Standard (CEDs)

- <https://ceds.ed.gov>



Data about Learning Resources

- Learning Resource Metadata Initiative (LRMI)

- <http://www.lrmi.net/specifications/lrmi/>



- Learning Metadata

- IEEE LTSC P2881
<https://sagroups.ieee.org/2881/>



Competency Frameworks

iNACOL Blended Learning
Teacher Competency Framework

The Learning Accelerator

iNACOL
International Association for K-12 Online Learning



COMMON CORE
STATE STANDARDS INITIATIVE

PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

PMP
Project Management Institute
PMP[®] Certified

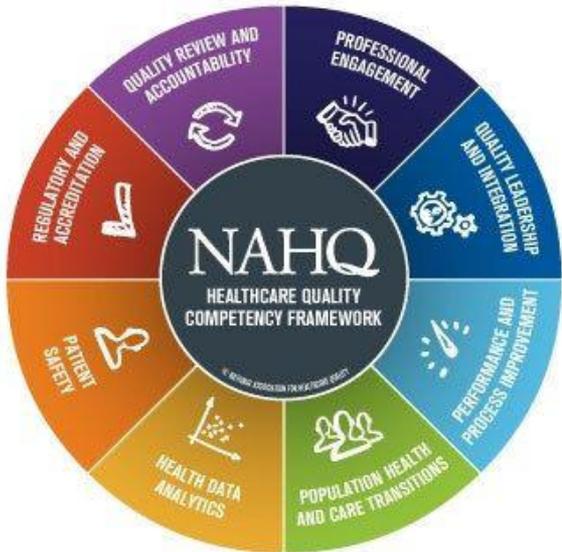


NEXT GENERATION
SCIENCE
STANDARDS

For States, By States

**Texas Essential
Knowledge and Skills**

ASCP
BOC
ASCP
BOARD OF
CERTIFICATION[®]



Many, many
others.

Data Formats for Competency Frameworks

- Achievement Standards Network
 - ASN Description Framework Schema
<http://standards.asn.desire2learn.com/>



- IMS Competencies and Academic Standards Exchange (IMS CASE)
 - <https://www.imsglobal.org/activity/case>



- Credential Engine
 - CTDL-ASN
<https://credreg.net/ctdlasn/handbook>

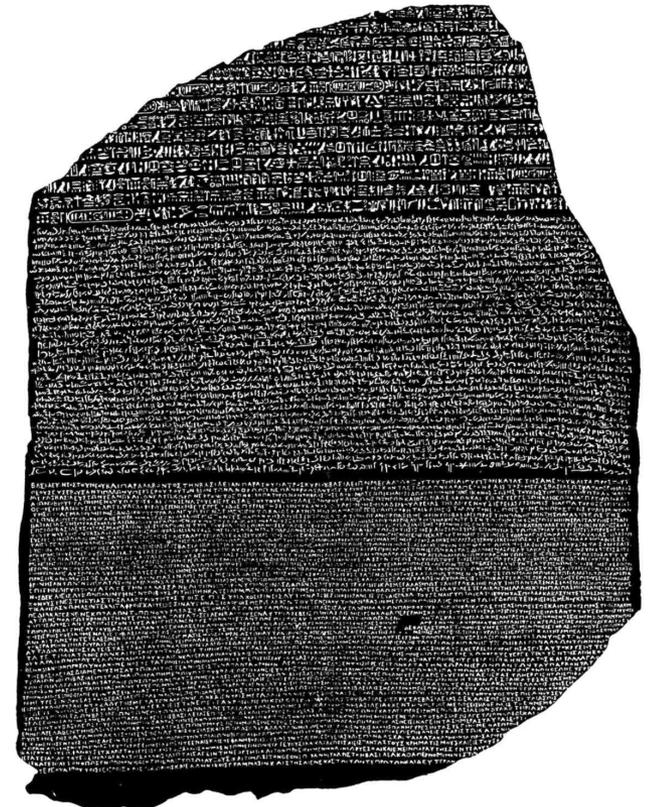


- T3 Innovation Network
 - Open Competency Framework Collaborative (OCFC)
<https://www.ocf-collab.org/>



Challenge: No Single Competency Framework

- Competency efforts break down when crossing borders between institutions, geographies, and domains.
 - School-to-school
 - State-to-state
 - K-12 to higher-ed
 - School to workforce
 - Military to private industry
- A comprehensive learner record may reference competencies from a dozen or more frameworks.



MatchMaker Education Labs

- Competency-Oriented Matching of *Educational Elements*
 - Competency Statements
 - Curriculum
 - Learning Resources
 - Learner Records
 - Assessments
 - Job Requirements
 - Demonstrated Skills



Q&A

- Contacting Us

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Quick Feedback

One-Minute Survey: https://www.surveymonkey.com/r/Aurora_11-17



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