Small But Mighty:
Data-Loaded Micro-credentials, the Professional Currency for the Digital Job Market

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https://www.coreskillsinstitute.com
Current State

- Certificates and degrees encompass a wide range of courses, curriculum, and specialties.
- Degrees do not articulate skills acquired.
- Students that do not finish a degree or certificate program leave with no evidence of skills attained.
- Trainees gain skills in a wide range of settings, often outside of a traditional degree path.
- Mismatch with industry expectations and degrees and job descriptions.
Digital Micro-credentials are Transforming Workforce Development

https://www.imsglobal.org/activity/comprehensive-learner-record
# Micro-credentials Support Workforce at All Levels

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical training programs</td>
<td>Highlight specialized skills needed and document mastery outside of a credit or transfer pathway.</td>
</tr>
<tr>
<td>High school</td>
<td>Specialized programs allow for skills mastery that is not recognized by industry. Students prepared for entry level technician work.</td>
</tr>
<tr>
<td>Associates</td>
<td>Skills acquired in courses, biotechnology programs, and research opportunities. These degrees are not sought after by industry.</td>
</tr>
<tr>
<td>Bachelors</td>
<td>A BS can encompass a wide variety of courses and lab experiences.</td>
</tr>
<tr>
<td>Graduate degree</td>
<td>MS, PhD's and post-docs struggle to compete for industry positions and documenting skills mastered during research.</td>
</tr>
<tr>
<td>Employees</td>
<td>Skills documentation for “on the job” training.</td>
</tr>
</tbody>
</table>
Micro-credentials as currency

BCSI

ASEPTIC TECHNIQUE - LAB BENCH

THERE'S DATA INSIDE!

- badge name
- badge URL (description)
- badge criteria
- badge image
- issuer
- issue date
- recipient
- tags
- alignment (standards)
- expiration date
- evidence URL
What can you do?

**Vision:** A future where students, trainees, and employees can accurately and reliably document the skills they acquire.

**Mission:** Bioscience Core Skills Institute provides workforce skills assessment and digital micro-credentials that are valid, reliable, and trusted by the bioscience industry. Working with educational and industry partners, BCSI provides assessment opportunities and documentation of skills.

Website: [https://www.coreskillsinstitute.com/](https://www.coreskillsinstitute.com/)
Our Model

BCSI supports evaluators and programs:

- Provides assessment events and delivers testing to the region’s programs.
- Supports the adoption of credentials for the training programs. Evaluators work closely with each other and provide reciprocal testing (evaluators are 3rd party to training program).
- Attends industry-oriented events in the region and markets the value of BCSI credentials in both new-hire and on-the-job skills documentation.
First Tier credentials:

- Quantitative Lab Skills I (Concentration, Conversions, Molarity)
- Small Volume Metrology (Micropipetting)
- Aseptic Technique (Lab Bench level)
- Documentation and SOP
- Laboratory Safety - Hazard Assessment
Industry informed

- Board of Directors: education, workforce, and industry expertise.
- Industry advisory group.
- Workforce development committees.
- Core Skill Standards for Bioscience Technicians - Russ Read
- Longitudinal tracking of credential seekers and employers
Industry Events

- Live, in-person demonstration of evaluation process.
- Feedback from industry professionals.
- Networking and alignment of skills language.
**Case Study**

- Regional workforce development training program.
  - Trainees recruited from under-employed and unemployed- no previous biotech experience.
  - Requirements for admission: HS diploma or GED.
  - Six week training program, 8 hours/day.
- Small cohorts 4-5 students in each cohort.
- Tested for all 5 first tier credentials at end of program.
<table>
<thead>
<tr>
<th>Small Volume Metrology</th>
<th>Objectives of the credential</th>
<th>Cohort 1</th>
<th>Cohort 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credentials earned:</td>
<td>30% of students</td>
<td>80% of students</td>
<td></td>
</tr>
<tr>
<td>Average % error in pipetting.</td>
<td>5.89%</td>
<td>1.35%</td>
<td></td>
</tr>
<tr>
<td>Determine the appropriate measurement tool to use when given a volume to deliver.</td>
<td>60%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Properly use a serological or micropipette to deliver a specified volume.</td>
<td>60%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Achieved less than 4% error</td>
<td>30%</td>
<td>80%</td>
<td></td>
</tr>
<tr>
<td>Quantitative Skills</td>
<td>Objectives of the credential</td>
<td>Cohort 1</td>
<td>Cohort 2</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Credentials earned:</td>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Convert numbers from standard to scientific notation format.</td>
<td></td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>Perform calculations for preparing a weight per volume percent and percent by volume or weight solutions.</td>
<td></td>
<td>50%</td>
<td>20%</td>
</tr>
<tr>
<td>Perform calculations to determine the amount of solute to add to create a solution, given a final description of normality, molarity, or molality.</td>
<td></td>
<td>0%</td>
<td>60%</td>
</tr>
<tr>
<td>Perform calculations given a standard equation and one or more variables.</td>
<td></td>
<td>0%</td>
<td>40%</td>
</tr>
</tbody>
</table>
**Problem 1:** You are preparing a solution of Benedict's reagent to use in testing for the presence of reducing sugars. You must prepare 100 mL of this solution. The first step includes adding sodium citrate ($C_6H_5O_7Na_3$ MW 258.06 g/mol), the final concentration of sodium citrate in the solution should be 0.67 M.

**Record the amount of sodium citrate needed in g:**

The second step is to add sodium carbonate ($Na_3CO_3$). The final concentration of sodium carbonate should be 10%, w/v.

**Record the amount of sodium carbonate needed in g:**

Lastly, you will add copper sulfate. You have a stock solution of copper sulfate that is 350X.

**Record the amount of copper sulfate needed in mL:**
## BCSI Credential Earners

<table>
<thead>
<tr>
<th>Highest degree earned</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current high school student</td>
<td>69.4%</td>
</tr>
<tr>
<td>High School or GED</td>
<td>9.0%</td>
</tr>
<tr>
<td>Associates</td>
<td>3.5%</td>
</tr>
<tr>
<td>Bachelors</td>
<td>2.8%</td>
</tr>
<tr>
<td>Masters</td>
<td>8.3%</td>
</tr>
<tr>
<td>Doctorate</td>
<td>6.9%</td>
</tr>
</tbody>
</table>

Next steps for BCSI credential earners:

- Employment in Biotech: 45%
- Employment Outside Biotech: 5%
- Further Education: 50%
Oscar’s story

Former KCKCC student in the BMFR program. The switch to COVID saw him unable to continue the program. He was hired to weigh powders at Millipore.

Through his supervisor Oscar was chosen to complete BCSI credentials during an early evaluation session hosted for several industry partners.

After successful completion of several of the micro-credentials Oscar was promoted to a QA position at Millipore in their Microbiology area. Oscar sees completing the micro-credentials as a key factor in his promotion.
National Data Set

- Novice - biomedical focus
- Novice - biotech skills focus
- Faculty and Industry Employees
Thank you!

BCSI Board of Directors
- Stephani Greytak
- Joseph Steensma
- Daryl Pint
- Russ Read
- Elizabeth Bader
- Sonia Hall
- Keith Gary

The BCSI evaluator team
For more information about BCSI:

info@coreskillsinstitute.com

We are seeking:

★ New regional partners
★ New evaluators
★ Programs to evaluate