Encouraging Cybersecurity Career Discovery via Career Assessment Tools

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K12 Career Development and Assessment

Chris Mackey,
General Manager

The Myers-Briggs Company

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1. Introduction to the Innovation Labs Project
2. K12 World of Work Integration Framework
3. Interests and Career Exploration in K12
Innovation Labs at The Myers-Briggs Co

Vision, Beliefs, and Values

Make personality and interest assessment accessible to everyone.

Seek to make data actionable by making it personal and meaningful.

Create strategic value for schools by helping them understand their students deeply.

Place control of data and relationships in the hands of the student user.
Our new model levels the playing field

Universal student access leads to organizational insight

Student Exploration

Interests Dashboard
Shifting Paradigms: The SuperStrong

Making Assessments More Accessible to More Students

• Rapid, mobile, and immediate
• Students complete in less than 10 minutes
• Self-interpretable and user friendly
• Valid, reliable, accurate

EXPLORATORY!
Despite their significance to both individuals and organizations, interests are often misunderstood, and their predictive power is often overlooked.

What’s so interesting about interests?

Interests spur action

What’s so interesting about interests?

Interests are fundamental

- Outcome
- Behavior
- Motivation
- Interests

- Goal Attainment
- Goal-Oriented Behaviors
  - Direction
  - Vigor
  - Persistence

Interests

What’s so interesting about interests?

Interests are predictive

<table>
<thead>
<tr>
<th></th>
<th>Ability</th>
<th>Personality</th>
<th>Interests</th>
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</thead>
<tbody>
<tr>
<td>Income</td>
<td>12.0</td>
<td>4.7</td>
<td>83.3</td>
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<tr>
<td>Occupational Prestige</td>
<td>58.9</td>
<td>8.2</td>
<td>32.9</td>
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<tr>
<td>Degree Attainment</td>
<td>57.2</td>
<td>7.4</td>
<td>35.4</td>
</tr>
<tr>
<td>College Persistence</td>
<td>66.4</td>
<td>11.9</td>
<td>21.7</td>
</tr>
<tr>
<td>Grades in College</td>
<td>50.4</td>
<td>23.1</td>
<td>26.6</td>
</tr>
</tbody>
</table>

Student Impact

Students responded with Agree or Strongly Agree

- 90% said “This was a valuable experience”
- 97% said “Clear understanding of my results”
- 85% said “Aware of more future options”
- 89% said “Better equipped to make decisions”

98% of students who began the SuperStrong assessment, completed it
Preparing All Students For the World of Work Network

The World of Work Network

#CVWoW #cvwowchat

www.cajonvalley.net
HOW IS THIS CONNECTED TO THE WORLD OF WORK
For too many students...
‘Why do I need to learn this?’

Too many graduates are mismatched to their jobs. What’s going wrong?

Students often aren’t aware of their own skills and experience, or what different jobs require. They need more meaningful careers advice.

▲ ‘Students need better careers advice to help them define their skills and attributes - and understand how these match different career options.’ Photograph: Alamy
Let's Close the Gap

**THE VISION**

- EDUCATION
- WORLD OF WORK

- EDUCATION
- WORLD OF WORK
Vocational Choice is the implementation of the Self-Concept.

(Hartung, 2013; Super, Savickas, & Super, 1996)
Integration Framework

Students connect their learning → Businesses connect their work

Implementation Framework
The Academic and Career Journey is comprised of 4 Levels

Level 1: Exploration
Level 2: Simulation
Level 3: Meet a Pro
Level 4: Practice

K12 Integration Framework
The Framework Provides

EXPOSURE

HEARD ABOUT IT
TINKERED WITH IT
MEET SOMEONE WHO DOES IT
PRACTICED IT
The vocational interest typology developed by Holland (1959, 1997) is the most widely adopted theoretical framework for interest measurement.
Career Development is a Human Process

“Any assessment, no matter how good, is only as good as the interpretation”

Dr. Ian Martin
Professor, Career Development
Every student will have a minimum of 6 world of work experiences each year L1 – L4 on the grid.
Students Want to Explore

Access Code: CVWOW
https://www.vitanavis.com
Students Want to Explore

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https://www.vitanavis.com
Students Want to Explore

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https://www.vitanavis.com
Kid Business Interview Questions

1. Why do you want to work with a fifth grade team to be part of a business?

2. What kind of business are you interested in?

3. What special qualities or traits (RIASEC) could you bring to make the business run smoothly and be successful?
Students Want to Explore

Access Code: CVWOW
https://www.vitanavis.com
Students Want to Explore

Access Code: CVWOW
https://www.vitanavis.com
Q & A
Raising the BAR

Behaviorally- Anchored Rating assessments of the readiness to learn

David H. Tobey, Ph.D.
Director of Research and Assessments
National CyberWatch Center
Purpose of assessment

Retrospective (Summative)
- Awareness
- Aptitude
- Achievement

Prospective (Formative)
- Diagnose
- Design
- Develop

Answers the question:
What are you ready for today?

Answers the question:
What can you be ready for tomorrow?
Zone of Optimal Performance

Can Do

Will Do

In the Zone

Done
Zone of Optimal Performance

SOURCE: Pavlov Tech Blog by Robin van Emden
**Zone of optimal performance**

**Attrition Rates**

17.3% 2\(^{nd}\) event  
44.9% 3\(^{rd}\) event

The Zone of Proximal Development

Source: Hill & Crevota (unpublished)
### The Zone of Proximal Development

<table>
<thead>
<tr>
<th>ISF Category</th>
<th>ISF Score</th>
<th>ISF Level</th>
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</thead>
<tbody>
<tr>
<td>Network Ports</td>
<td>6</td>
<td>Novice</td>
</tr>
<tr>
<td>Network Protocols</td>
<td>16</td>
<td>Novice</td>
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<tr>
<td>Attack Types</td>
<td>12</td>
<td>Expert</td>
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<tr>
<td>Network Components</td>
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<td>Competent</td>
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<td>Basic Networking Commands</td>
<td>7</td>
<td>Competent</td>
</tr>
<tr>
<td>Network Addressing</td>
<td>15</td>
<td>Novice</td>
</tr>
<tr>
<td>Network Architectures</td>
<td>25</td>
<td>Beginner</td>
</tr>
<tr>
<td>AAA</td>
<td>12</td>
<td>Expert</td>
</tr>
<tr>
<td>Windows Security Features</td>
<td>7</td>
<td>Beginner</td>
</tr>
<tr>
<td>Server Configuration</td>
<td>2</td>
<td>Novice</td>
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<tr>
<td><strong>ISF Total</strong></td>
<td><strong>115</strong></td>
<td><strong>Novice</strong></td>
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</tbody>
</table>


Available for non-commercial use under Creative Commons license the National Security Agency’s National Cybersecurity Curriculum Program (NCCP).

http://thecybercube.org/nccp/
Assessment-informed Delivery of Learning Content

Adaptive Content A
Adaptive Assessment
Assessment Score
Objective 1 ★★
Objective 2 ★
Objective 3 ★★★

Adaptive Content B
Adaptive Assessment
Assessment Score
Objective 1 ★★★
Objective 2 ★★
Objective 3 ★★

Brad
Sally
Tailored instruction adapted to each learning profile
### Resident Apprentice Job Duty Rotations

<table>
<thead>
<tr>
<th>Behavioral Task Statements</th>
<th>Frequency Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess and Analyze Risk</td>
<td></td>
</tr>
<tr>
<td>Decide the risk ratings of a vulnerability based on the technical information and how the technology is deployed/importance of the systems</td>
<td>Once a month or less</td>
</tr>
<tr>
<td>Escalate breaches of contract by vendor to management and legal team</td>
<td>Once a month or less</td>
</tr>
<tr>
<td>Verify assessment tool outputs contain all necessary data elements for vulnerability analysis and risk determination</td>
<td>A few times a month</td>
</tr>
<tr>
<td>Communicate risks to internal stakeholders (within your group or department)</td>
<td>Every day</td>
</tr>
<tr>
<td>Document risk and impact analysis of system components for management</td>
<td>Once a month or less</td>
</tr>
<tr>
<td>Alert end users of potential risks and vulnerabilities that they may be able to mitigate</td>
<td>Once a week</td>
</tr>
<tr>
<td>Communicate key risks to users of a system, application, device, or other components impacted by threats or vulnerabilities</td>
<td>Once a week</td>
</tr>
<tr>
<td>Scan all impacted systems to ensure the patch or mitigations are present and the risk associated with the vulnerability has been reduced as expected</td>
<td>A few times a month</td>
</tr>
</tbody>
</table>
Q & A
Why Assess?

Companies struggle with qualifying “non traditional” hires and managing equity in any hiring system.

Prequalifying talent based on a standardized assessment focuses investment on candidates with the greatest potential for success.
Employer Directive

Strong Math, Grit, Problem Solving, Emotional Intelligence and Life Skills are just some of the many factors identified. When distilled, three themes arose:

- Math
- Logic & Critical Thinking
- EQ
- Work Ready
# Quantitative Analysis

<table>
<thead>
<tr>
<th>Topic</th>
<th>Section</th>
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<tbody>
<tr>
<td>Math</td>
<td>Quantitative Literacy (QL)</td>
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<tr>
<td></td>
<td>Quantitative Reasoning (QR)</td>
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<tr>
<td></td>
<td>Conceptual Math (CM)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Topic</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Thinking</td>
<td>Selection of Relevant Information</td>
</tr>
<tr>
<td></td>
<td>Summarizing Main Conclusions</td>
</tr>
<tr>
<td></td>
<td>Drawing Conclusions</td>
</tr>
<tr>
<td></td>
<td>Identifying Assumptions</td>
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<tr>
<td></td>
<td>Assessing Impact of Additional Evidence</td>
</tr>
<tr>
<td></td>
<td>Detecting Reasoning Errors</td>
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<tr>
<td></td>
<td>Matching Arguments</td>
</tr>
<tr>
<td></td>
<td>Applying Principles</td>
</tr>
</tbody>
</table>

43
Qualitative Analysis

Steps:
- Standard rubric
- Screen
- 1:1 Skills transference
- Company Interview
Pilot Applicant Demographics (12/13/18)

Applicant Pool - 9327

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
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<tbody>
<tr>
<td>Women</td>
<td>2872</td>
</tr>
<tr>
<td>Minorities</td>
<td>5163</td>
</tr>
<tr>
<td>Veterans</td>
<td>2898</td>
</tr>
<tr>
<td>Non-Targeted</td>
<td>1791</td>
</tr>
</tbody>
</table>
Current Apprentice Demographics

Male percentage is high due to veteran hiring.
Current Apprentice Demographics

Veteran

- Veteran: 64%
- Non veteran: 36%

Age

- Average age = 32

- 26-35: 62%
- 36-45: 23%
- Over 45: 7%
- Under 26: 8%
Current Apprentice Demographics

Occupational Role %

- Other: 5%
- Network Operations Developer: 8%
- IT Support Professional: 17%
- Data Center Technician: 20%
- Cloud Operations Specialist (1&2): 25%
- Software Developer (1&2): 25%
Current Apprentice Data

- Median Salary of Previously Employed: $37,000
- Unemployed Prior to Apprenti: 22%
- Median Salary of All Prior to Apprenti: $29,000
- Median Salary in Apprenticeship: $51,000
- Median Retained Salary: $75,000
- Apprentices Retained: 77%
- 4-Year College Degrees: 54%
- Youngest Placed: 18
- Eldest Placed: 63

* Will finish at 85% once remainder of third cohort completes placement
For more information, please contact
jcarlson@washingtontechnology.org
Or visit
www.ApprentiCareers.org
Thank You for Joining Us!

**Upcoming Webinar:** “Computational Thinking and Skills: A Foundation for STEM and Cybersecurity Education”

**When:** Wednesday, January 16, 2019 at 2-3pm EST


[nist.gov/nice/webinars](https://nist.gov/nice/webinars)