Assessment of 21st Century Professional Competencies of Undergraduate Students

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University of Nebraska-Lincoln
Question

What skills will help new graduates perform well on the job and foster career development?
To what extent are we helping our students develop 21st Century Skill Sets?
Question: To what extent do we, as employee providers, meet employer expectations?

Employer Expectations

Provider Expectations

Question: Are we connected or disconnected?
How we are approaching the challenge?

The Bigger Question

How do we know if we are meeting the challenge?

UNL’s Undergraduate Environmental Studies Program

21st Century Skills

Assessment

Discipline Competency

Student-focused

Broad education

Systems & Sustainability Thinking

Community

Cooper 2011
Our Approach

“....assessment tools to hire, retain, develop and manage the best talent in the market.

Our assessments are at work for many Fortune 500 companies in 90 countries in 40 languages

Partner with Business
Data Collection
Target Training International's TriMetrix™ Assessment

Disposition Attributes

How
(Give and Receive Information)
Behavior
DISC

Why
(Time & Energy)
Attitudes
Motivational Drivers

What
Personal Competencies
(23 or 25)
DNA INDEX

Personal DNA
Competencies

- are a way of talking about what helps people get results in their jobs.

- refer to skills or knowledge that lead to superior performance.

- are not "fixed"—they can usually be developed with effort and support.

Modified from: http://www.carltonglobal.com/samplelesson_HR.pdf
## Our Challenge

### Competency Domains

<table>
<thead>
<tr>
<th>Cognitive</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning and Organizing</td>
<td></td>
</tr>
<tr>
<td>Problem Solving Ability</td>
<td></td>
</tr>
<tr>
<td>Decision Making</td>
<td></td>
</tr>
<tr>
<td>Conceptual Thinking</td>
<td></td>
</tr>
<tr>
<td>Creativity</td>
<td></td>
</tr>
<tr>
<td>Futuristic Thinking</td>
<td></td>
</tr>
</tbody>
</table>

### Intrapersonal

| Continuous Learning           |                                            |
| Goal Achievement              |                                            |
| Resiliency                    |                                            |
| Self-Management               |                                            |
| Flexibility                   |                                            |
| Personal Accountability       |                                            |

### Interpersonal

| Employee Development/Coaching |                                            |
| Presenting                   |                                            |
| Diplomacy and Tact           |                                            |
| Understanding and Evaluating Others |                                        |
| Customer Focus               |                                            |
| Interpersonal Skills         |                                            |
| Leadership                   |                                            |
| Teamwork                     |                                            |
| Conflict Management          |                                            |
| Empathy                      |                                            |
| Persuasion                   |                                            |
| Written Communication        |                                            |
| Negotiation                  |                                            |
Data Set and Analysis

• Pre- and Post-program Approach
• 170 Students (includes 129 matched pairs)
• 2009 to 2015
• Multilevel Modeling Framework to Account for Dependence (Generalized ANOVA)
Personal Competencies and Skills (What?)

- Experience
- Context
- Self-Report
  - Perception of others
  - Self-perception
  - Self-efficacy

Dave’s Data
Data Set 1: Pre-Program Differences

Pre-Program Comparison - Male Vs Female

- Planning and Organizing: Mean Difference = 0.89**
- Persuasion: Mean Difference = -0.99**
- Personal Effectiveness: Mean Difference = -1.61*
- Negotiation: Mean Difference = -1.01**
- Management: Mean Difference = -0.67**
- Empathy: Mean Difference = 0.98*
- Diplomacy: Mean Difference = 0.85**
- Decision Making: Mean Difference = -1.36*

*p < 0.01
**p < 0.05
***p < 0.10
Data Set 2: Pre- and Post Change

*\( p < 0.01 \)
**\( p < 0.05 \)
***\( p < 0.10 \)

Pre- to Post-Program Changes

(Scale 0 to 10)

<table>
<thead>
<tr>
<th>Category</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEAMWORK</td>
<td>0.41</td>
</tr>
<tr>
<td>PRESENTING</td>
<td>0.45</td>
</tr>
<tr>
<td>LEADERSHIP</td>
<td>0.58</td>
</tr>
<tr>
<td>FUTURISTIC THINKING</td>
<td>0.39</td>
</tr>
<tr>
<td>EMPLOYEE DEVELOPMENT AND...</td>
<td>0.76</td>
</tr>
<tr>
<td>DIPLOMACY</td>
<td>0.66</td>
</tr>
<tr>
<td>CONTINUOUS LEARNING</td>
<td>0.52</td>
</tr>
</tbody>
</table>
Data Set 3: Gender Differences

* $p < 0.01$
** $p < 0.05$
*** $p < 0.10$

Pre- to Post-Program Changes - Gender
(Scale 0 to 10)

- Teamwork (M): 0.60 ***
- Presenting (M): 0.69 **
- Personal Effectiveness (F): 0.39 ***
- Personal Effectiveness (M): -0.44 ***
- Leadership (F): 0.40
- Leadership (M): 0.80 **
- Empl. Dev. & Coaching (F): 0.87
- Empl. Dev. & Coaching (M): 0.68 **
- Diplomacy (F): 0.68 **
- Diplomacy (M): 0.72 **
Data Set 4: Comparison to Workforce
Data Set 4: Comparison to Workforce
Data Set 4: Comparison to Workforce Mean

Comparison of Average Competencies to Workforce Mean

- %Competencies = Mean
- %Competencies Above Mean

Ave = 68 +/- 12

Graduation Year

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Average Competencies Achieved</td>
<td>60</td>
<td>60</td>
<td>90</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

Environmental Studies
An Undergraduate Degree Program
Get involved. Get connected. Pursue your passion.
Summary

• Business-related instruments provide useful assessment information about 21st century skill development

• Gender differences in perceived ability pre-program and changes from pre- to post program

• Collective Pre- to Post- Program Improvement - Continuous Learning; Diplomacy, Employee Development and Coaching; Futuristic Thinking; Leadership; Presenting; and Teamwork
A Big Question for Higher Education

To what extent do we help our students develop competence for professional practice in the 21st Century?
Questions
Geoscientists by Occupation and Industry

70% Bachelors
26% Masters
3% Ph.D

n = 322,683 jobs
2018 projected

Data: U.S. Bureau of Labor Statistics
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• On average ENVR Students meet or exceed 70% of current mean workforce skill sets.