A different take of the “skills gap”: Why cultivating diverse competencies is essential for success in the 21st century economy

Wisconsin Center for the Advancement of Postsecondary Education (WISCAPE)

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2. Higher education and workplace training must both adopt teaching methods that foster these competencies and encourage transfer.

3. Education-industry partnerships that facilitate communications and foster students’ cultural and social capital need to be developed.

4. Reframe the debate: Skills gap “narrative” results in misdiagnosis of complex issues facing higher education, workforce, and society.
The skills gap becomes a meme
Context: Anxiety about the changing nature of work

### Some terminology

<table>
<thead>
<tr>
<th>Skills mismatch:</th>
<th>More general idea that supply of and demand for skills out of synch (over or undersupply)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills shortage:</td>
<td>Lack of job-related skills in labor market (US short of IT workers)</td>
</tr>
<tr>
<td>Skills gap:</td>
<td>Widespread shortfalls in skilled employees lead to slow economic growth, based on failure of education system</td>
</tr>
</tbody>
</table>

Frameworks for analyzing skills problems

Internal labor markets: Employers screen candidates and invest in skills training

Market dynamics: Job search is 2-way dynamic, self-correcting marketplace

Education supply chain: Industry adjusts productivity based on educational “product”
The Skills Gap at Work

“Critical disjunctions exist between what is taught and learned in postsecondary education and the skills that are in high demand in the workplace.”

Business - Higher Education Forum (2011, p.4)
Skills Gap & Postsecondary Education Policy

“I've frequently heard from employers that they cannot find enough skilled workers to fill positions. The skills gap is a very real concern in Wisconsin and around the country.

In the next ten years, approximately seventy percent of jobs will require some training behind a high school diploma but less than a four year degree.” [3/24/13]

“Folks can make a lot more, potentially, with skilled manufacturing or the trades than they might with an art history degree.” [1/30/14]
Future Wisconsin Project
Led by the Wisconsin Manufacturers & Commerce (WMC)
Projected Jobs in WI by Educational Attainment (2020)

63% of the jobs in WI will require postsecondary education

Since 2010 the economy has added 6.6 million jobs

2.9 million are “good” jobs - upper 1/3 median wage

2.8 million of those jobs went to college graduates

Good jobs are full time, 2X more likely to have benefits

Managers, STEM professionals, health care

## Projections for Hot Jobs in Wisconsin for 2016

<table>
<thead>
<tr>
<th>Registered Nurses</th>
<th>Total Jobs 2016</th>
<th>% Growth 2006-2016</th>
<th>Total Annual Jobs</th>
<th>Average Wage</th>
<th>Educ. Required</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>64,550</td>
<td>2.6</td>
<td>2,190</td>
<td>$57,376</td>
<td>Bachelor’s/ Associates</td>
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<tr>
<td>Truck Driver</td>
<td>59,440</td>
<td>1.1</td>
<td>1,530</td>
<td>$38,070</td>
<td>Med On-job Training</td>
</tr>
<tr>
<td>Admin Asst.</td>
<td>35,460</td>
<td>1.2</td>
<td>880</td>
<td>$35,322</td>
<td>HS/Expe</td>
</tr>
<tr>
<td>Accountant</td>
<td>23,810</td>
<td>1.5</td>
<td>770</td>
<td>$58,374</td>
<td>Bachelor’s</td>
</tr>
<tr>
<td>Carpenter</td>
<td>33,130</td>
<td>1.0</td>
<td>700</td>
<td>$38,760</td>
<td>LT On-job Training</td>
</tr>
<tr>
<td>Computer Systems</td>
<td>13,290</td>
<td>2.0</td>
<td>520</td>
<td>$62,862</td>
<td>Bachelor’s +</td>
</tr>
<tr>
<td>Welders</td>
<td>12,930</td>
<td>0.9</td>
<td>360</td>
<td>$33,933</td>
<td>Postsecondary Vocational</td>
</tr>
<tr>
<td>Industrial Mechanic</td>
<td>9,030</td>
<td>0.9</td>
<td>250</td>
<td>$43,525</td>
<td>LT On-job Training</td>
</tr>
<tr>
<td>Industrial Engineer</td>
<td>6,350</td>
<td>1.5</td>
<td>240</td>
<td>$63,365</td>
<td>Bachelor’s +</td>
</tr>
</tbody>
</table>

Underlying Assumptions Behind the Skills Gap Narrative

**Assumption #1:** Employers are having a hard time finding skilled applicants

**Assumption #2:** Causal link to unemployment, slow economic growth

**Assumption #3:** Education (esp. 4-year liberal arts) is to blame - overly academic coursework

**Assumption #4:** Education should offer more hands-on learning, especially apprentice/internships

**Assumption #5:** Education must “align” to industry by allowing industry needs to shape programmatic offerings

Skills Desired: Technical, synonymous with occupations (e.g., welders)

Purpose of Higher Education? Job Training

Assumption #2: Causal link to unemployment, slow economic growth
Policy Responses in Wisconsin

**Investments**

2013
- $15m employer-led training
- Labor Market Data System
- Office of Skills Development

2014
- $35m additional training
- WTCS grant - reduce waiting lists

**Disinvestments**

- $500 million cut from UW System since 2011

- UW-Platteville: Reduction of writing requirement from 2 to 1 course

- UW-LaCrosse: Lost $40,000 to support undergrad research

Post-training wages were $17.19/hour (Round 1) and $12.17/hour (Round 2) - Living wage for family of 4 in Green Bay, WI is $21.95
Skepticism about the Skills Gap Narrative

“It is difficult to think of a labor market issue where academic research or even research using standard academic techniques has played such a small role, where parties with a material interest in the outcomes have so dominated the discussion, where the quality of evidence and discussion has been so poor, and where the stakes are potentially so large.

There has been little testing of the assumptions behind arguments.....”

Dr. Peter Capelli, University of Pennsylvania Wharton School of Business (2014)
National Research Council 21st Century Competencies

**Cognitive:** knowledge, cognitive strategies (e.g., critical thinking), creativity

**Interpersonal:** teamwork and leadership

**Intrapersonal:** work ethic, intellectual openness, positive self-evaluation

Goal is **transfer**able knowledge and competencies
1. What skills do employers and educators in Wisconsin consider essential for workplace success?

2. How, if at all, are employers and educators actively cultivating these skills?

3. What types of cross-sector partnerships exist, and how do they influence skills cultivation?
Our Approach To Studying Education-Industry Dynamics

Field Theory from Relational Sociology; Cultural Models Theory from Cognitive Anthropology

**Education**

- 4-Yr University
- 2-Yr College

Field: A bounded social space w/ visible structures, roles, and invisible rules

Fields interact via conflict and/or coordination

Individuals and Organizations are positioned in fields based on the accrual of capital ($, social, and cultural)

Actors in fields develop shared subjectivities or “cultural models” about valued capital (e.g., skills)

They are reproduced (e.g., teaching) and rewarded (e.g., hiring)

**Industry**

- Biotech

Actors in fields develop shared subjectivities or “cultural models” about valued capital (e.g., skills)

They are reproduced (e.g., teaching) and rewarded (e.g., hiring)

Individuals’ “striving” or action determined by habitus or “cultural unconscious” internalized from multiple fields
Study Methods

NSF-ECR Grant: 2012 - 2015 ($526,022) & 2016 ($104,233)

69 Educators

72 Employers

Manufacturing (no food or furniture)

Biotechnology
RQ1: Valued cultural capital for workplace success

Salience: the mean percentile rank for each term across all respondent lists; the measure indicates the degree to which a term was both frequently cited and the order in which it was reported.

<table>
<thead>
<tr>
<th>Term</th>
<th>Salience</th>
<th>Term</th>
<th>Salience</th>
<th>Term</th>
<th>Salience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sample</td>
<td></td>
<td>All employers</td>
<td></td>
<td>All educators</td>
<td></td>
</tr>
<tr>
<td>(n=115)</td>
<td></td>
<td>(n=66)</td>
<td></td>
<td>(n=49)</td>
<td></td>
</tr>
<tr>
<td>Technical ability</td>
<td>0.348</td>
<td>Work ethic</td>
<td>0.350</td>
<td>Technical ability</td>
<td>0.380</td>
</tr>
<tr>
<td>Work ethic</td>
<td>0.309</td>
<td>Technical ability</td>
<td>0.323</td>
<td>Critical thinking</td>
<td>0.367</td>
</tr>
<tr>
<td>Technical knowledge</td>
<td>0.259</td>
<td>Technical knowledge</td>
<td>0.275</td>
<td>Work ethic</td>
<td>0.255</td>
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<tr>
<td>Critical thinking</td>
<td>0.256</td>
<td>Critical thinking</td>
<td>0.173</td>
<td>Technical knowledge</td>
<td>0.239</td>
</tr>
<tr>
<td>Communication</td>
<td>0.153</td>
<td>Communication</td>
<td>0.129</td>
<td>Teamwork</td>
<td>0.204</td>
</tr>
<tr>
<td>Teamwork</td>
<td>0.149</td>
<td>Adaptable</td>
<td>0.125</td>
<td>Communication</td>
<td>0.185</td>
</tr>
<tr>
<td>Innovative</td>
<td>0.105</td>
<td>Self-motivated</td>
<td>0.116</td>
<td>Innovative</td>
<td>0.154</td>
</tr>
<tr>
<td>Self-motivated</td>
<td>0.099</td>
<td>Interpersonal</td>
<td>0.109</td>
<td>Detail-oriented</td>
<td>0.125</td>
</tr>
<tr>
<td>Adaptable</td>
<td>0.098</td>
<td>Teamwork</td>
<td>0.107</td>
<td>Troubleshoot</td>
<td>0.100</td>
</tr>
<tr>
<td>Detail-oriented</td>
<td>0.097</td>
<td>Experience</td>
<td>0.107</td>
<td>Lifelong learning</td>
<td>0.096</td>
</tr>
<tr>
<td>Lifelong learning</td>
<td>0.095</td>
<td>Attitude</td>
<td>0.104</td>
<td>Hands-on</td>
<td>0.082</td>
</tr>
</tbody>
</table>

National Research Council (Pellegrino & Hilton, 2012): cognitive, interpersonal, and intrapersonal competencies [skills, knowledge, and application]
Bare minimum, reading, writing, and some mechanical aptitude, but much of that can be trained [Manufacturing, Middleton, WI]

I don't wanna have to train somebody of how to turn on a computer and get into Outlook, and how to schedule a meeting. They should know those things upfront [Biotechnology, Madison, WI]

But, you can't train people to be trainable [Biotechnology HR, Madison, WI]
We spend a lot of time here so having people that are just horses asses for a lack of a better word just we don't want them here. A because it's a pain to be around them but B it takes away the meaningful discussions and the problem solving, which is basically what we do here. (Manufacturing Supervisor, La Crosse, WI)

If someone can show me how to teach positive attitude, or ethics, values, I would gladly institute those classes. When people ask, "What keeps you from hiring someone?" It's not that they don't have the technical skill. (Manufacturing executive, Green Bay, WI)
2 Cultural Models

Self-regulated learners
  Motivation, study skills, self-monitoring

Work ethic
  Reliability, deferred gratification, morality

Origins? School, parents and family, church, society
RQ2: How Educators Cultivated Cultural Capital in Students

Over-arching focus on critical-thinking/problem-solving and supporting self-regulated learning

47% - critical thinking and problem-solving (e.g., undergrad research)

44% - teamwork (e.g., small group work, randomized selection)

35% - work ethic (e.g., attendance/effort graded, attention to detail)

Over 50% did not speak about inter- and interpersonal competencies
On the importance of time

Electrical is a difficult trade to learn, there's no short cuts in that. So the skill sets that they're trying to teach for maintenance mechanic, that will take someone a long time to learn that [WTCS Administrator]

On the value of exposure to multiple disciplines

“Many companies will say, ‘Your two-year and four-year degrees are so bloated, why would I need someone that needs English or history,’ and they don’t understand that that’s going to make a really good employee. I don’t argue, but it’s happened where an employer comes back and says, “You were right.” [WTCS administrator]

“I rely on those general education instructors to help me with those soft skills, especially communication.” [WTCS instructor, electronics]
RQ2: How Employers Cultivated Cultural Capital in Employees

Many approach skills through screening for “fit” with organizational culture

Most employers are not providing formal training

41% - informal shadowing (e.g., follow Bob around for 4 weeks)
11% - formal courses (e.g., new machinery)
3% - interpersonal skills (e.g., conflict resolution workshops)

A 2015 Manpower Group survey (n= 41,700) found that “employers are not doing enough to address talent shortages.”
Only 1 in 20 are increasing wages/benefits
Only 1 in 5 are providing additional training/PD to existing staff
### RQ3: Types of Education-Industry Relations & Impacts

<table>
<thead>
<tr>
<th>Type of Collaboration</th>
<th>Example</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Training for Employees</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training at Ed Org</td>
<td>Company sends staff to local college/university for courses</td>
<td>Employee develops new form of cultural capital (i.e., skills)</td>
</tr>
<tr>
<td>Co-Designed Company Training</td>
<td>Company and local educators collaboratively design training</td>
<td>Employee develops new form of cultural capital/company acquires new program</td>
</tr>
<tr>
<td><strong>Guiding Programmatic Direction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curriculum Advisory Boards</td>
<td>State- or industry-mandated advisory boards w/industry reps</td>
<td>Direct communication of industry needs/Feedback channel re:alumni</td>
</tr>
<tr>
<td><strong>Developing Student Competencies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multi-Contact Programs</td>
<td>Apprenticeships and internships</td>
<td>Student acquires new form of cultural capital valued by both fields and social (i.e., networks)</td>
</tr>
<tr>
<td>One-Time Programs</td>
<td>Industry field trips/career days</td>
<td>Exposes students to new field(s)</td>
</tr>
<tr>
<td>Curricular Co-construction</td>
<td>Course projects suggested by local employers</td>
<td>Student acquires new form of cultural capital salient to industrial field</td>
</tr>
</tbody>
</table>
Conclusions: More Complicated than a “Skills Gap”

**State Actors**
- Attempt to Shift Internal Logic of 4-Year to Match 2-Year
- Need Better X-Field Communications
- Student Pathways, Collaborations
- Need to Bolster Ability & Desire to Train 21cc

**Education**
- 4-Yr University
- 2-Yr College
- Need to Bolster Ability to Teach 21cc
- Higher Education and Workplace Training Need to Evolve & Improve
- Not Just Education’s Responsibility: School, Business, Family, Community (Multiple Sources to Blame)

**Industry**
- Biotech
- Need to Bolster Ability & Desire to Train 21cc
- Hiring Problems: Poor Applicants, Screening for “Fit”, Low Wages, Isolated Facilities

**State Actors**
- Public $$ for Private Training While Cutting Public HE
To meet workforce needs we need to support, fund, and encourage the teaching (and training) profession. Development of the full range of 21st century competencies will require **systematic instruction** and **sustained practice**. It will be necessary to devote additional instructional **time and resources** to advance these sophisticated disciplinary learning goals over what is common in current practice (NRC, 2012).
Self-regulation and work ethic are foundational competencies, but become habituated by school, family, and work.

Source: http://www.sponsoringyoungpeople.org
Support multiple educational pathways, but understand the trade-offs:
Key considerations of time and exposure to multiple disciplines

4-Year Degree
- Lengthy & Expensive but Comprehensive Education w/Focus

2-Year Degree
- Shorter & Cheaper w/Some General Education but More Focused

Certificates & Bootcamps
- Super Short & Cheaper (Maybe) Only Focused Single Field
“The very successful manufacturers are the ones who figured out the job training stuff 30 years ago. Who said, we've got to have a continuous leaning environment around here to figure this out.”

(Representative of WI Manufacturers & Commerce)
Multiple forms of cross-field relations exist, but communications and students pathways are critical

Source: http://www.shudah.co.uk

Source: http://www.valenciacollege.edu
The skills gap "narrative" is a distraction and needs to be retired.

No Evidence
Ignores Teaching 21st CC
Assigns Blame to 1 Party
Represents a Narrow View of Education

THE IT SKILLS GAP IS REAL!
Here’s What We Can Do to Close It.
What is the purpose of public higher education?

“"To harmonize and promote the interests of agriculture, manufactures and commerce...; to develop the reasoning faculties of our youth, enlarge their minds, cultivate their morals." (Thomas Jefferson, 1818)

“There is a broadly enabling role that schooling can play with respect to the economy-a role of preparing people to be adaptive to the various settings they may encounter over the course of their working lives." (Lauren Resnick, 1987)
To meet the state’s workforce needs requires a vision and plan for public higher education similar to that of Founding Father Thomas Jefferson.

Continuing to ignore teaching for transfer across the 21st century skill set in ALL postsecondary institutions and workplace training is a disservice to our students, the business community, and society.
Policy Recommendations

1. Establish new requirements that teachers entering the WTCS and UW system AND workplace trainers receiving state funds to take courses in instructional design and teaching methods.

2. Allocate funds supporting the design and delivery of these courses.

3. Increase funding for career counseling, Centers for Teaching & Learning, and internship/apprenticeship programs at public colleges and universities.

4. Increase state support for the UW System and WTCS - skills-related solutions begin and end here.

5. Re-frame the debate: Reject the skills gap narrative in favor of a more collaborative and productive vision.
Next Steps

Education-industry dynamics in other regions and countries
Focus on 4 high-STEM job regions of the US
Comparative analysis of US, China, Japan, S. Korea, Singapore

Blended course on teaching inter- and interpersonal competencies for postsecondary instructors

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Thank You! For more information: matthew.hora@wisc.edu