Skill and Attribute Demands of Agriculture Employers: A Best-Worst Scaling Approach

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Introduction

Research Question
What are the skills and attributes that employers seek in new hires (often college graduates) within the agricultural industry?

Objective
Examine agricultural industry representatives’ perceptions concerning skills, knowledge, and abilities they believe are most important in new hires.
Scope of Study

Study Sample: Industry professionals attending the 2017 Fall Agricultural Career Fair at Illinois State University

50+ participating companies

- Agribusiness
- Agricultural Communication
- Agricultural Economics
- Horticulture and Landscape Management
- Animal Science
- Crop Science
Methodology

From previous research (Kibler and Barrowclough, 2017), six skills were identified and selected:

1. Applying knowledge/skills to the work environment
2. Being innovative/creative
3. Computer applications/Staying current on technology
4. Locating, organizing, and evaluating information to solve complex problems
5. Oral/written communication
6. Working with others in teams
Methodology

A stated choice method, “Best-Worst Scaling”, was used to elicit participant preferences towards the importance of the six identified skills.

Why use “Best-Worst Scaling”? This choice-based method has significant advantages over other survey formats (e.g., ratings scales). It allows for an individual’s strength of preference for multiple objects to be calculated over a defined measurement range, providing similar information as a logistic regression model.
**Methodology**

How was “Best-Worst Scaling” implemented in our study? Participants were shown 10 different scenarios, with each scenario containing a list of three individual skills.

**Sample Best-Worst Scaling Scenario**

<table>
<thead>
<tr>
<th>Most Important</th>
<th>Skill</th>
<th>Least Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>____</td>
<td>Being innovative/creative</td>
<td>____</td>
</tr>
<tr>
<td>____</td>
<td>Oral/written communication</td>
<td>____</td>
</tr>
<tr>
<td>____</td>
<td>Working with others in teams</td>
<td>____</td>
</tr>
</tbody>
</table>
A total of 71 surveys were completed, with 50 of the 52 companies attending the career fair participating.

<table>
<thead>
<tr>
<th>Agriculture Fields</th>
<th>Primary Field</th>
<th>Associated Fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agribusiness</td>
<td>47.1%</td>
<td>80.0%</td>
</tr>
<tr>
<td>Ag Communications</td>
<td>7.1%</td>
<td>42.9%</td>
</tr>
<tr>
<td>Ag Economics</td>
<td>4.3%</td>
<td>41.4%</td>
</tr>
<tr>
<td>Agronomy</td>
<td>17.1%</td>
<td>57.1%</td>
</tr>
<tr>
<td>Animal Science</td>
<td>2.9%</td>
<td>22.9%</td>
</tr>
<tr>
<td>Horticulture</td>
<td>8.6%</td>
<td>21.4%</td>
</tr>
<tr>
<td>Other</td>
<td>12.9%</td>
<td>20.0%</td>
</tr>
</tbody>
</table>
## Results: Skill Importance using Best-Worst Scaling

<table>
<thead>
<tr>
<th>Skill</th>
<th>Most (B)</th>
<th>Least (W)</th>
<th>Aggregate (B-W)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>167</td>
<td>71</td>
<td>96</td>
<td>2</td>
</tr>
<tr>
<td>#2</td>
<td>55</td>
<td>195</td>
<td>-140</td>
<td>5</td>
</tr>
<tr>
<td>#3</td>
<td>25</td>
<td>220</td>
<td>-195</td>
<td>6</td>
</tr>
<tr>
<td>#4</td>
<td>123</td>
<td>80</td>
<td>43</td>
<td>4</td>
</tr>
<tr>
<td>#5</td>
<td>189</td>
<td>51</td>
<td>138</td>
<td>1</td>
</tr>
<tr>
<td>#6</td>
<td>151</td>
<td>93</td>
<td>58</td>
<td>3</td>
</tr>
</tbody>
</table>

Skill #1 = Applying knowledge/skills to the work environment  
Skill #2 = Being innovative/creative  
Skill #3 = Computer applications/Staying current on technology  
Skill #4 = Locating, organizing, and evaluating information to solve complex problems  
Skill #5 = Oral/written communication  
Skill #6 = Working with others in teams
# Results: Skill Importance using Best-Worst Scaling

<table>
<thead>
<tr>
<th>Skill</th>
<th>( \sqrt{B/W} )</th>
<th>Standard Ratio</th>
<th>Mean (B-W)</th>
<th>StDev (B-W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1.54</td>
<td>0.75</td>
<td>0.27</td>
<td>0.92</td>
</tr>
<tr>
<td>#2</td>
<td>0.53</td>
<td>0.12</td>
<td>-0.39</td>
<td>0.83</td>
</tr>
<tr>
<td>#3</td>
<td>0.34</td>
<td>0.00</td>
<td>-0.55</td>
<td>0.61</td>
</tr>
<tr>
<td>#4</td>
<td>1.24</td>
<td>0.57</td>
<td>0.12</td>
<td>0.98</td>
</tr>
<tr>
<td>#5</td>
<td>1.93</td>
<td>1.00</td>
<td>0.39</td>
<td>0.82</td>
</tr>
<tr>
<td>#6</td>
<td>1.27</td>
<td>0.59</td>
<td>0.16</td>
<td>0.97</td>
</tr>
</tbody>
</table>

Skill #1 = Applying knowledge/skills to the work environment  
Skill #2 = Being innovative/creative  
Skill #3 = Computer applications/Staying current on technology  
Skill #4 = Locating, organizing, and evaluating information to solve complex problems  
Skill #5 = Oral/written communication  
Skill #6 = Working with others in teams
Implications and Future Research

**Implications**
- Instructors may choose to tailor existing course activities (assignments, group projects, presentations, etc.) or create new opportunities to enhance student abilities in these areas.
- By identifying the skills that employers find “most important”, educators may provide a classroom experience which better prepares students for employment in the highly competitive agriculture industry.

**Future Research**
- Do student perceptions concerning workplace skills and abilities align with the demands of agricultural employers?
Thank you!

Questions?
Additional Results

Skill B-W Summary

- Computer applications/Staying current on technology
- Being innovative/creative
- Locating, analyzing, and evaluating information to solve complex problems
- Working with others in teams
- Applying knowledge/skills to the work environment
- Oral/Written communication

Mean (B-W)
Skill Importance - Heterogeneity

- Oral/Written communication
- Applying knowledge/skills to the work environment
- Working with others in teams
- Locating, analyzing, and evaluating information to solve complex problems
- Being innovative/creative
- Computer applications/Staying current on technology
Additional Results

![Individual BWS Scores](image)

- Working with others in teams
- Computer applications/Staying current on technology
- Oral/Written Communication
- Locating, analyzing, and evaluating information to solve complex problems
- Being innovative/creative
- Applying knowledge/skills to the work environment
Additional Results

Agribusiness BWS Scores

- Working with others in teams
- Computer applications/Staying current on technology
- Oral/Written Communication
- Locating, analyzing, and evaluating information to solve complex problems
- Being innovative/creative
- Applying knowledge/skills to the work environment
Additional Results

Agricultural Communications BWS Scores

- Working with others in teams
- Computer applications/Staying current on technology
- Oral/Written Communication
- Locating, analyzing, and evaluating information to solve complex problems
- Being innovative/creative
- Applying knowledge/skills to the work environment
Additional Results

Agricultural Economics BWS Scores

- Working with others in teams
- Computer applications/Staying current on technology
- Oral/Written Communication
- Locating, analyzing, and evaluating information to solve complex problems
- Being innovative/creative
- Applying knowledge/skills to the work environment
Additional Results

Agronomy BWS Scores

- Working with others in teams
- Computer applications/Staying current on technology
- Oral/Written Communication
- Locating, analyzing, and evaluating information to solve complex problems
- Being innovative/creative
- Applying knowledge/skills to the work environment
Additional Results

Animal Science BWS Scores

- Working with others in teams
- Computer applications/Staying current on technology
- Oral/Written Communication
- Locating, analyzing, and evaluating information to solve complex problems
- Being innovative/creative
- Applying knowledge/skills to the work environment
Horticulture BWS Scores

- Working with others in teams
- Computer applications/Staying current on technology
- Oral/Written Communication
- Locating, analyzing, and evaluating information to solve complex problems
- Being innovative/creative
- Applying knowledge/skills to the work environment
Additional Results

Other BWS Scores

- Working with others in teams
- Computer applications/Staying current on technology
- Oral/Written Communication
- Locating, analyzing, and evaluating information to solve complex problems
- Being innovative/creative
- Applying knowledge/skills to the work environment
Additional Results

Human Resource BWS Scores

- Working with others in teams
- Computer applications/Staying current on technology
- Oral/Written Communication
- Locating, analyzing, and evaluating information to solve complex problems
- Being innovative/creative
- Applying knowledge/skills to the work environment
Additional Results

Non-Human Resource BWS Scores

- Working with others in teams
- Computer applications/Staying current on technology
- Oral/Written Communication
- Locating, analyzing, and evaluating information to solve complex problems
- Being innovative/creative
- Applying knowledge/skills to the work environment