Workforce Development Survey Project
• Assess workforce development needs
• Assess most effective training methods
• Assess barriers to industry training

General outline of the survey:
• What workforce development needs are most critical to your success?
• When training your existing workforce, what delivery method is most effective for you?
• For your organization’s professional engineers and scientists, what is the area of greatest need for training?
• For your organization’s technicians and operators, what is the area of greatest need for training?
• What are your organization’s most significant limitations or barriers to training?
Where the polling was done
Both real-time and on-line polling

Regional Meeting Polling
Real-time polling done at 5 regional meetings
- Mix of large and small companies, academia, government, non-profits
- Meeting 1: single session
- Meetings 2-5: separate ‘Industry’ and ‘Academic’ sessions

Qualtrics Industry Survey
On-line survey sent to 207 industry representatives
- Mix of small and large companies (responses anonymous, so final composition unknown)
- Regional Meeting attendees, companies who had provided letters of support for application, and/or who had been recently contacted for outreach (n=49 respondents)

Combined Survey Data
Pooled data from some Regional Meeting sessions and Qualtrics survey
- Regional Meeting 1 and Meetings 2-5 ‘Industry’ session data included
## Profile of survey respondents

<table>
<thead>
<tr>
<th>Poll</th>
<th>Industry</th>
<th>Academia</th>
<th>Government / Non-profit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional Meeting</td>
<td>73</td>
<td>24</td>
<td>25</td>
<td>122</td>
</tr>
<tr>
<td>Qualtrics*</td>
<td>49</td>
<td>0</td>
<td>0</td>
<td>49</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>122</strong></td>
<td><strong>24</strong></td>
<td><strong>25</strong></td>
<td><strong>171</strong></td>
</tr>
</tbody>
</table>

| Total (%)       | 71.3%    | 14.0%    | 14.6%                    | 99.9% |

*Note: the Qualtrics survey was sent to 207 industry contacts, 143 (69.1%) of these were industrial Regional Meeting attendees; remaining were contacts from NIIMBL application/outreach efforts.
Which workforce development needs are most critical to your success? (choose 4)

- Recruiting Experienced Technical Staff: 22.4
- Retention of Degreed Staff: 16.8
- Recruiting Experienced Grads: 15.9
- Training Existing Staff: 15.5
- Retention of Technical Staff: 12.2
- Recruiting new Grads (any degree): 9.9
- Recruiting Experienced Technical Staff (non-degreed): 3.9
- Other: 3.3
When training your existing workforce, what delivery method is most effective for you? (choose 4)

- In-house Training with Internal Trainers: 23.4
- Online Materials with Hands-on Experiences: 21.8
- External Training w Lecture & Hands-on Experiences: 18.0
- In-house Training with External Trainers: 16.0
- External Training (e.g. short courses): 9.5
- Online Materials: 7.3
- Other: 3.9
For your organization's professional engineers and scientists, what is the area of greatest need for training? (choose 4)

- GMP/Quality/Risk Analysis: 13.5
- Emerging Therapies (e.g. cell or gene therapy): 12.5
- Advanced Manufacturing Technologies: 12.1
- New Analytical Technologies: 11.2
- Continuous Manufacturing: 8.8
- Process Modeling: 7.8
- Automation: 7.6
- IT/Data Acquisition & Analysis: 7.6
- Validation: 7.0
- Leadership/Management: 6.3
- Single-Use Technologies: 3.3
- Other: 2.5
For your organization's technicians and operators, what is the area of greatest need for training? (choose 4)

- GMP/Quality/Risk Analysis: 17.4
- Advanced Manufacturing Technologies: 13.1
- Automation: 12.7
- Validation: 11.7
- New Analytical Methods: 11.5
- Single-Use Technologies: 8.4
- Continuous Manufacturing: 7.6
- Emerging Therapies (e.g. cell or gene therapy): 6.7
- IT/Data Acquisition & Analysis: 6.3
- Process Modeling: 1.4
- Leadership/Management: 1.0
- Other: 2.2
What are your organization's most significant current limitations or barriers to training? (choose 4)

- Time: 31.7%
- Cost: 27.2%
- Timeliness of training: 14.8%
- Lack of access to equipment or technology: 12.8%
- Management buy-in on training ROI: 9.7%
- Other: 3.9%
Conclusions

Training method
Most effective is conducted internally by both internal & external personnel, but also hands-on experiences with on-line or lectures or materials is valuable.

Recruitment
Industry would like to hire experienced technical staff, and then recruit, train and retain experienced graduates, and existing technical staff.

Training needs for engineers & scientists
More focus on GMP, Quality, Risk Analysis, followed closely by emerging products and new analytical technologies.

Training needs for operators & technicians
Focus on GMP, Quality, Risk Analysis, as well as advanced manufacturing technologies, automation, validation, and new analytical methods.

Limitations
Time and cost. Timeliness of training as well as lack of access to equipment or technology and lack of management buy-in.