Skills for innovation in the European chemical industry

12 December 2014, Brussels
Chemical industry in the Value Chains

**Process Industry:**
Chemical, biochemical, and physical transformation and formulation of raw materials using continuous and batch processes into materials with specific properties and functionalities

**Discrete Manufacturing:**
Innovation chain

Skills needed to build all pillars
Skills for innovation - industry needs

In order to speed up the delivery of solutions to societal challenges and to remain competitive, the European chemical industry needs the right workforce, prepared to push innovation forward.

<table>
<thead>
<tr>
<th>Business skills</th>
<th>Personal skills</th>
<th>Scientific &amp; Technical skills</th>
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Skills for Innovation in the European Chemical Industry
### Skills needs for innovation: main findings

<table>
<thead>
<tr>
<th>Critical skills</th>
<th>For engineers</th>
<th>For scientists</th>
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</thead>
<tbody>
<tr>
<td>Business</td>
<td>Project management</td>
<td>IPR</td>
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<td></td>
<td>Innovation management</td>
<td>Innovation management</td>
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<td></td>
<td>Understanding customers &amp; suppliers</td>
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<td>Personal</td>
<td>Communication</td>
<td>Creative thinking</td>
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<td></td>
<td>Team work</td>
<td>Team work</td>
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<td>Problem solving</td>
<td>Communication</td>
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### Scientific and technical

Because innovation often happens at the interface of disciplines, **scientific interdisciplinarity** is key for innovation and the future of the chemical industry.
European chemical sector, needs future engineers and scientists with:

- a broader scientific skill set that goes beyond traditional single discipline teaching
- a strategic awareness of business and innovation management issues

Opportunities for context- and problem-based learning need to be considered when developing courses.
Barriers and constraints to integrating industry’s needs in HE teaching

- Professors assessed on research output
- Existing curricula focused on research, not for the whole innovation chain
- Co-operation across disciplines is difficult in traditional HE structures
TWO STUPID CHICKENS:

HOW DO I GET TO THE OTHER SIDE?!!!

YOU ARE ON THE OTHER SIDE!
Building Skills Capacity Together

Industry and HEIs to build together the skills capacity for tomorrow

- Create synergies
- Define concrete actions

Right workforce for Research AND Innovation
Building Skills Capacity: what needs to be done?

- Enhanced dialogue and collaboration between HEIs and industry on skills for innovation issues and course development

- Greater awareness among HE teaching staff of the benefits of context-based teaching resources

- Better dissemination of ‘good practices’ for the introduction of skills for innovation into HE courses (methodologies, course design, involvement of industry and to demonstrate the value active learning)
SusChem Educate to Innovate
Leveraging value from investment in strategic innovation programmes

**SusChem R&I Projects**
Innovation themes / approaches

**Dissemination work packages**
General communication
Exploitable results
Industrially focused training packages

GAP

**SusChem Educate to Innovate**
linking innovation themes to teaching / learning outcomes in higher education (undergraduate)
SusChem Educate to Innovate

(undergraduate / Masters level)

Dialogue / Ideas exchange to enhance innovation skills

EU HEIs

Development & Testing

New Learning Resources

EU Industry

SusChem related R&I projects

Innovation Content

(chemical / industrial biotechnology)
SusChem Educate to Innovate
for the development of flexible, exciting learning resources

- **Rich in content** from case studies / pilot lines / real world examples
  - Learn through failure as much as success
  - Documented methodologies for problem-based studies
  - Understand how / why decisions were made
  - Supported by good reference material

- **Accessible** across different media platforms

- **Adaptable** to different teaching curricula demand / learning styles / approaches

- **Flexible** in use (not a standalone learning module)

- **Appeal** to a broad community
SusChem Educate to Innovate
Effecting a Mindset Change

- Consideration of education potential as part of project impact assessment
  - from undergraduates to lifelong learning

- Integrate educational outputs into project exploitation plan

- Engagement of ‘teaching’ academics at appropriate stage of the project

- Enable effective exploitation of project outcomes into education beyond project timeframe

- Build appropriate framework into project funding mechanism
• Cefic's **online platform** and **multimedia magazine**
• Bridging the gap between **younger audiences** and the **chemical industry**
• 14 active **young chemists** from renowned European universities
• Sharing the **great innovations** taking place in Europe and pointing to a more **sustainable future**
• Growing support from the main **EU Scientific networks** & Partner with **key scientific events**
• Strong **social media** presence – Twitter, Facebook, Pinterest, Instagram - Follow us!

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