Shaping the Future of the Professional Workforce

Moderators

Meg Lassarat
CFO & Senior Vice President
Universal Pegasus International

Jorge Vanegas
Dean, College of Architecture
Texas A&M University
This highly interactive breakout forum will enable participants to explore and discuss the current challenges and future opportunities associated with the supply and demand sides of the professional workforce entering the capital projects industry.
The supply chain of the professional workforce is a critical element of flawless capital project execution, and also, in addressing the needs for (1) increased numbers of new talented men and women in the workforce; and (2) higher levels of quality of their skills and abilities.
Strengthening this supply chain is an imperative that must be urgently addressed through higher levels of collaboration and dialogue between Industry and Academia.
Let’s start with a question...
• When was the last time any of you had a meaningful discussion with an Academic on Industry needs?

1. Within the last six months
2. Within the last year
3. Within the last 5 years
4. Never really have, or cannot remember
Shaping the Future of the Professional Workforce

The Education Supply Chain
The Total Education Supply Chain Pipeline

Workforce (Professional & Non-Professional)

Grey

Post-Doctoral Programs

Doctoral Programs

Graduate Programs

Minors; Certificates; Accreditations; Professional & Continuing Education Courses, Seminars, & Workshops; Massive Open Online Courses (MOOCs); Life Long Learning...
The Focus of this ECC Initiative

- Workforce (Professional & Non-Professional)
- Pre-K
- High School
- 2 Yr. College
- 4 Yr. University (Bachelors Programs)
- Graduate Programs (Masters)
- Doctoral Programs
- Post-Doctoral Programs
- Grey
- Capital Projects
- Industry
• Among others, the **Capital Projects Industry** has two critical needs that **Academia** must satisfy, as the primary supplier of the professional workforce entering the industry:

  ❑ *How can academia increase the **input**, **volume**, **flow**, and **output** of professionals within the education pipeline?*

  ❑ *How can academia increase their **quality**?* (knowledge, skills, abilities, proficiencies, mastery, mindsets, and life long learning attributes)
But, do we really know what “quality of the professional workforce” means?...
• What are the **ideal attributes, characteristics, and expectations of a new graduate** entering the Capital Projects Industry today, based on **your experience**, and from the **corporate point of view of your company**?

• We will follow a process in small groups:
  - **Quiet Time** – write down your thoughts
  - **Round Robin** – read your ideas within the group, one at a time, and discuss briefly after everyone has done it
  - **Selected Share** – selected presentations to the whole group
And now, to give us an example of **innovative practices** in preparing the professional workforce from an **Industry** perspective, let us introduce our first panelist...
Shaping the Future of the Professional Workforce

Panelist 1 – Industry

Sharon Paul
Group Talent Officer
Kentz Engineers & Constructors
The Experience at Kentz Engineers & Constructors
Kentz Engineers & Constructors

We Make Challenging Projects Happen....
History of Strong Growth

Revenue & Backlog ($ m)

- **Revenue**
- **Backlog**

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue</th>
<th>Backlog</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>$0</td>
<td>$500</td>
</tr>
<tr>
<td>2008</td>
<td>$500</td>
<td>$1,000</td>
</tr>
<tr>
<td>2009</td>
<td>$1,000</td>
<td>$1,500</td>
</tr>
<tr>
<td>2010</td>
<td>$1,500</td>
<td>$2,000</td>
</tr>
<tr>
<td>2011</td>
<td>$2,000</td>
<td>$2,500</td>
</tr>
<tr>
<td>2012</td>
<td>$2,500</td>
<td>$3,000</td>
</tr>
</tbody>
</table>
Global Reach
Industry & Academic Collaboration

Nottingham Trent University
Our Business Case for Change

To resource future projects

To obtain academic excellence from an accredited institution

To have real work application

To incorporate our strategies

To support our global structure and focus on team
Why Nottingham Trent University?

No. 1 in the UK for work-based learning and degrees

No. 1 in the UK for number of Professional Doctorates in Business

No. 3 in the UK for undergraduate applications
Why Nottingham Trent University?

No. 4 in UK for no. of student placements

First to design and deliver an in-company degree programme

Industry proven construction school
Program Design

• Kentz stakeholders and NTU Faculty collaboratively built a custom program

• Kentz Senior Management to participate.

• Determined locations for delivery

• Designed to maximize teamwork
• Class projects linked to our strategic objectives and challenges.

• Modules include soft skill development

• Iterative program design to meet our changing requirements
# Kentz NTU Programme

## Diploma in Management & Leadership

<table>
<thead>
<tr>
<th>Management Fundamentals</th>
<th>Leading People</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managing and Leading Strategic Change</td>
<td>Strategy in Action</td>
</tr>
</tbody>
</table>

## Hi Potential Employees

## MSc in Management & Leadership

<table>
<thead>
<tr>
<th>Business Research Methods</th>
<th>International &amp; Global Business Management</th>
</tr>
</thead>
</table>
Strategic Projects

Safety Culture

Asset Management

Employer Branding

Project Execution
Classroom Environment

4 Cohorts
64 Students
11 Countries
Building Global Relationships

Teamwork

Action Learning
Continuous Improvement

Feedback
• Realigned MSc criteria to link to high potential program

• Added soft skills and behavioral classes to Modules

• Delivered Regional Modules in academic environment

• Incorporated strategic areas of focus into the modules

• Consistent global content and delivery for soft skills training in regions outside of the program
Shaping the Future of the Professional Workforce

Thank you, Sharon!

Are there any questions for Sharon at this time?
And now, to give us an example of innovative practices from an Academic perspective, let us introduce our second panelist...
Shaping the Future of the Professional Workforce

Panelist 2 – Academia

Simaan Abourizk
Professor and Canada Research Chair in Operation Simulation
University of Alberta
Academic Perspective:
The Experience at the University of Alberta

Department of Civil and Environmental Engineering
Hole School of Construction Engineering
Our Focus
University of Alberta: Construction Engineering and Management Program
Training of MSc, PhD, Post Docs
Hole School of Construction Engineering: Built upon University-Industry Collaboration

University
- 6 faculty
- 6 staff
- 80 Grad students

Industry
- 35 companies
- Knowledge
- Projects
- Funding $

NSERC
- Oversight
- QA/QC
- Funding $

Hole School of Construction Engineering
- Highly Qualified Personnel
- Technologies
- Knowledge Transfer
Growth of the program and the role of industry played

**Program begins with 2 faculty**

1986

- Lobbies University, raises funds to establish program

1990

- Graduate Program established
- Engaged in setting up program, Funding research, Defining problems and Participating in lectures

1997

- Industrial Research Chair established; Works with University to apply for prestigious Industrial Research Chair; 6 major companies involved Provides 50% of funding and NSERC covers 50% funding

2002

- Canada Research Chair awarded

2004

- Program named Hole School of Construction Engineering
- Significant Donations from individuals/families in the construction business.
- 20 companies involved in the partnership

2012

- 16 more companies added to the partnership
- Significant support from industry towards teaching and research.

3 Industrial Research Chairs/ 2 Major CRDs

**Industry’s input**
## Teaching

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Industry Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Management</td>
<td>Case studies, guest lecturers. Mentoring faculty</td>
</tr>
<tr>
<td>Construction Administration</td>
<td>Offered by a practitioner from Industry</td>
</tr>
<tr>
<td>Information Management in Construction</td>
<td>Case studies, database deployments in industry</td>
</tr>
<tr>
<td>Construction Law</td>
<td>Offered by a practitioner from Industry</td>
</tr>
<tr>
<td>Advanced Planning and Control – Linear Construction</td>
<td>Faculty work with companies on learning about planning and control. Industry projects used as case studies</td>
</tr>
<tr>
<td>Design and Analysis of Construction Operations</td>
<td>Projects are selected from industry for operations improvement by students</td>
</tr>
<tr>
<td>Productivity Improvement</td>
<td>Projects are selected from industry for operations improvement by students</td>
</tr>
<tr>
<td>Quantitative Risk Analysis</td>
<td>Students from this course established a leading risk analysis company.</td>
</tr>
<tr>
<td>Best Practices in Construction Management</td>
<td>Practicing professionals take the course along with students. Jointly work on projects.</td>
</tr>
<tr>
<td>Construction Equipment and Methods</td>
<td>Field trip to sites and industry-based projects</td>
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</tbody>
</table>
Research Activity - 5 year cycle

- Industrial Research Chair in Construction Engineering and Management
- Industrial Research Chair in the Industrialization of Building Construction
- Industrial Research Chair in Strategic Construction Modelling and Delivery
- Planning and Control of Industrial Construction and Maintenance Projects
- Decision Support in Construction Projects
HSCE Research Examples

- Integrated Simulators for Construction: COSYE

[Diagram showing various components and interactions related to simulation in construction, including product models, production processes, real-time updates, and other computer programs.]
HSCE Research Examples

• Best Practices Projects

Absenteeism Tracking Tool

Skills Development Tool for Construction Trades Foremen

Proportion of Causes of Absence

- Personal Issues: 60%
- External Issues: 15%
- Interpersonal Relationships: 2%
- Project Management and Supervision: 12%
- Work/Job Conditions: 11%

For the following list of factors, please choose ONLY UP TO 3 REASONS that contributed to your most recent absence and rank them in order of significance, 1 being the most significant and 3 being the least significant. Please do not choose more than 3 reasons.

<table>
<thead>
<tr>
<th>Causes of Absence</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2.</td>
</tr>
<tr>
<td>1. Personal safety concerns</td>
<td></td>
</tr>
<tr>
<td>2. Poor working conditions</td>
<td></td>
</tr>
<tr>
<td>3. Disputes with foreman/supervisor</td>
<td></td>
</tr>
<tr>
<td>4. Child care difficulties</td>
<td></td>
</tr>
<tr>
<td>5. Other family responsibilities</td>
<td></td>
</tr>
</tbody>
</table>

RADAR DIAGRAM
Comparison Between Group Evaluations and Company's Overall Mean

- Foreman's Mean Self Evaluation
- Supervisors' and Peers' Mean Evaluation
- Crew Members' Mean Evaluation
- Company's Overall Mean

FOREMAN SKILLS DEVELOPMENT TOOL
SUPERVISOR AND PEER MANUAL

Name of Foreman Being Evaluated: __________________ Date: Day/Month/Year

Your Job Category: (e.g., General Foreman, Superintendent, Foreman, Field Engineer, QA, Safety, Materials, etc.)

Length of time the foreman has been under your supervision ON THIS PROJECT OR WITH THIS COMPANY:

days/weeks/months/year (circle one) or __________________ Not applicable

Length of time the foreman has been under your supervision ON ANY OTHER PROJECTS OR
## Benefits of Collaboration

<table>
<thead>
<tr>
<th>University</th>
<th>Industry</th>
<th>NSERC</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Strong program attracts top scholars</td>
<td>• High quality personnel</td>
<td>• Successful research funding with measureable outputs</td>
</tr>
<tr>
<td>• Superior research output</td>
<td>• Networking with academics and other industry companies</td>
<td>• Developing critical mass in research area to improve competitiveness</td>
</tr>
<tr>
<td>• Endowments</td>
<td>• Targeted, usable research outcomes</td>
<td></td>
</tr>
<tr>
<td>• Research funding</td>
<td>• Technologies, improvements, best practices</td>
<td></td>
</tr>
</tbody>
</table>
The Challenge

• How can industry address the current challenges and future opportunities associated with the supply and demand sides of the professional workforce entering the capital projects industry?
Initiatives proven to have worked

- Collaboration on joint research projects
- Opening doors for research projects undertaken by students
- Encouraging and supporting undergrads to pursue MSc degrees
- Work with academia on course development and delivery
Thank you, Simaan!

Are there any questions for Simaan at this time?
So, what **tangible actions** could we take in shaping the future of the professional workforce for the Capital Projects Industry?...
From the corporate point of view of your company, and based on your opinion and your reaction to the two presentations from our panelists, two questions to shape the professional workforce for our industry:

- If you had the power and the means to do so, what 3 things would you change in academia?
- If you had the power and the means to do so, what 3 wishes do you have for academia?

We will follow the same process in small groups (Quiet Time, Round Robin, Selected Share).
Based on what we have heard and discussed about changes in, and wishes for, academia in shaping the professional workforce for our industry, if you had an academic audience composed of administrators and faculty:

- What would you ask them?
- What would you tell them?

We will follow the same process in small groups (Quiet Time, Round Robin, Selected Share)
In closing, our goal is...
To Close the Gap between Industry & Academia

ACADEMIA → Needs → GAP → CAPITAL PROJECTS INDUSTRY

Professional Workforce
To Close the Gap between Industry & Academia

ACADEMIA → GAP → CAPITAL PROJECTS INDUSTRY

Needs

Professional Workforce
Stay tuned…

Thank you!