

DEVELOPING GOOD PRACTICES FOR INDUSTRIAL ENGAGEMENT IN CO-CREATION OF CDIO CURRICULUM

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OVERVIEW OF WORKSHOP

The CDIO framework promotes industrial engagement in the engineering curriculum design and implementation as a good practice in order to develop “Industry-ready” graduates, and meeting Standard 2 of the CDIO standards (CDIO Standard v2.1, 2018). However, what does good practice industry engagement in the engineering CDIO curriculum look like? This workshop world café style will provide the opportunity to review three case studies of industrial engagement in the CDIO curriculum and propose new avenues for further co-creation of such curriculum;

1. New engineering provision at Canterbury Christ Church University to yield ‘Industry-ready engineering graduates’.
2. Skoltech design from a clean slate adapting CDIO syllabus for graduate studies.
3. CESI has developed the apprenticeship model to educate and train future engineers

KEYWORDS

CDIO Syllabus, Industrial Engagement, Curriculum Design, Apprenticeship

DURATION 1.5hrs

ACTIVITIES

Introduction (20mins)

Short introduction (5 mins) to workshop and an overview of each User Case Studies (5mins each);

1. Brand new undergraduate engineering provision at Canterbury Christ Church University has been co-designed with industry using good systems requirements engineering practice (Sommerville and Sawyer, 1997). New curriculum also embeds CDIO and active learning to yield ‘Industry-ready engineering graduates’.
2. Skoltech was designed from scratch starting in 2011 based on an adapted CDIO syllabus modified for graduate studies focused on innovation development. The methodology followed the CDIO process where industrial and academic experts were surveyed to establish the priority of Crawley et al, 2013 curriculum learning outcomes.

This industry co-design approach has been shown to be most important to develop an innovation focused graduate program in line with the CDIO standards.

3. Since 1985, CESI has developed the apprenticeship model to educate and train future engineers. This model combines students spending periods of time in industry and school, both providing work-based and work-related learning opportunities. In 2015, CESI decided to redefine its curricula by embedding CDIO approach, (Rouvrais et al 2018) and co-designed in collaboration with industry.

Discussion and Analysis (40mins)

Audience in groups of 8-12 are to join a table for 12mins hosted by a User Case presenter who acts a conversation facilitator (Habermann, 2013). At each table the audience has the opportunity World Café style (Brown, 2005) to learn more, converse, reflect, share and capture the cross-pollination of ideas and collective understanding (Schieffer, 2004) on the User Case Study with respect to CDIO Syllabus Standard 2. The audience will be encouraged to document on the World Café table cloths (Fouche and Light, 2011) their collective thoughts of the strengths, weaknesses, opportunities and threats of the method. Then move to new table.

Intermediate Plenary (10mins)

Intermediate plenary aims to provide both the opportunity for the audience to return to an approach to make further enquires, reflections and analysis about a particular approach. Also, enable each table host to summaries the audiences' perceptions.

Best Practice (10mins)

Table host is to facilitate the identification and documentation, *iBid*, on table clothes provided the group's collective concluding headline guidelines for good practice for industrial engagement in co-creation of the curriculum to support CDIO Syllabus Standard 2.

Concluding Plenary (10mins)

Aims of the concluding plenary is to capture and summarise of all the recommended headline guidelines for good CDIO industrial engagement and practice identified in the workshop. Each table in turn presenting a headline guideline until all the derived guidelines have been captured and shared with the audience.

TARGET AUDIENCE

Audience some experience in leading engineering courses, or designing engineering CDIO curriculum or industrial engagement or delivering engineering apprenticeship learning. Typical roles Curriculum designers, Project coordinators, Industrial engagement leads, Director of Engineering Studies, Course Leaders, Placement lead, Apprenticeship lead.

OUTCOMES

The workshop will identify top level guidelines for good practice industrial engagement in CDIO curriculum co-design. The workshop will also provide the opportunity to identify other areas of good practice in CDIO industrial engagement to be reviewed. Further research and development of an industrial engagement rubric/guidelines to support the CDIO Syllabus and academic paper on good practice for the CDIO and engineering education community.

SPECIAL REQUIREMENTS

World café style, tables organised to see 8-12 delegates around table, flip chart pens and PC and projector.

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BIOGRAPHICAL INFORMATION

Clément Fortin is the Professor of the Practice, Associate Provost, Dean of Faculty and Postdoctoral Affairs at Skoltech, Skolkovo Institute of Science and Technology, Moscow. In his research work, Clément Fortin has worked extensively with students and research staff in the field of advanced manufacturing and Product Lifecycle Management (PLM).

Anne Nortcliffe Helene Leong-Wee Kwee Huay is the New Founding Head of Engineering, Technology and Design at Canterbury Christ Church University, Canterbury. Anne Nortcliffe is currently leading the development of new CDIO engineering provision and facility in Canterbury, also active engineering pedagogical researcher and developer. Currently part of a Royal Academy for Engineering funded research project asking are Engineering Educators fit for purpose?

Morgan Saveuse is the Dean of Studies, CESI Ecole d’ingenieurs, Paris. Since 2013, he has implemented PjBL in Industrial and Civil engineering curricula at ei.CESI School. Morgan Saveuse is active in researching impact work-based learning to support student learning. eXia@CESI is the second French CDIO collaborator, joined in 2016.

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