

HOW TO TEACH AND/OR LEARN THE ENGINEERING DESIGN PROCESS

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OVERVIEW OF THE ROUNDTABLE

What must our programs and teaching methods be to help more students become comfortable and autonomous in completing an open ended engineering design task within a complex system of customer, society, environment, economics and other dimensions to take into account?

KEYWORDS

Engineering design, teaching design, design process, design assessment, Standards: 1, 2, 3, 4, 5, 7, 8, 9, 10, 11.

ACTIVITIES

The specific goals of the workshop are: **to analyse** what engineering design entails with its processes and artifacts; **to determine** (judge) what challenges our students face when designing; **to evaluate** some design activities and their anticipated effects on the students' attributes development; **to analyse** what could constitute an authentic and complex activity for sustaining the development of the students' engineering design attribute; **to evaluate** how the teaching staff might be able to map out their students' progression on that aspect (from novice to expert); and **reflect upon** the adequacy of the design graduate competencies development in view of industry needs and actual professional practices.

The workshop will start with teaching-learning-assessing examples or references that will then be discussed and critiqued among participants following a "think/team-up/share" in 15 minute cycles for each objective. The proposed specific objectives to discuss include: engineering design process, student and educator challenges, engineering design activities, authenticity and expertise development in the engineering design process.

Notes will be taken at the teams' tables by the participants during team discussions and general notes will be taken by one of the presenters during the sharing part of each cycle. These discussion cycles will be followed by a short plenary to highlight important discussed items by participants.

TARGET AUDIENCE

Novice to expert educators involved in engineering design process teaching to students. A diversity of approaches to the design process education is favored to enrich the discussions and exchanges in the roundtable.

FOLLOW-UPS

From discussions in the roundtable, a summary document will be compiled and submitted to participants. Depending on findings a possible CDIO Workgroup could be created to help solve difficult common issues.

REFERENCES

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BIOGRAPHICAL INFORMATION

Daniel Spooner: is a professor of engineering practice at École Polytechnique de Montréal (ÉPM). He also taught at Université de Montréal's School of Industrial Design. In the last 20 years, he has lead multidisciplinary development teams in industry for more than 70 products in the transport, consumer, medical, and telecommunication fields. He is responsible for the CDIO introductory and interdisciplinary capstone projects for mechanical engineering at ÉPM since 2006. Daniel is a founding member of Polyfab, ÉPM's growing community accessible Fablab and holder of a Chair in project based learning.

François Rivest: is a pedagogical counselor at the Pedagogical support and innovation office at Polytechnique Montréal. He has a master's degree in education from Université de Montréal, an advanced graduate diploma in online learning community building from Université du Québec à Montréal (UQAM), a bachelor's degree in high school history teaching from UQAM as well, and a diploma of college studies in translation (French, English, and basic German) from Collège Ahuntsic. François has worked in education for over 25 years. What fascinates and moves him the most is to participate in and be witness to the learning process of other human beings.

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