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The present webinar is organized within the framework of

15th IACEE World Conference
Hosted at University of Porto

May 17-20, 2016

Conference Theme

INNOVATION IN CONTINUING PROFESSIONAL DEVELOPMENT:
A VISION OF THE FUTURE

Thank you for joining us in this webinar.
We will start shortly.

For more information:

www.iacee2016.com
Email: iacee2016@fe.up.pt
Innovations in Continuing Engineering Education

A webinar hosted by the IACCE
15th World Conference in Porto
A FEW HOUSEKEEPING NOTES:

• Agenda
• Technical assistance
• Questions

Moderator of this webinar:

Soma Chakrabarti, Ph.D.
First Vice-President, IACEE
Vice-President for Member Services & Communications
Director, Continuing Studies
Professional and Continuing Studies
University of Delaware (USA)
Innovations in Continuing Engineering Education: an introduction

Presenter:

Marc GOOSSENS, M.Ph.Sc. (1966)
Executive Director of SEII (Belgium)
Member of the Council of IACCE
marc-goossens@skynet.be
Innovation in Engineering Education

New ways of learning – Extended competencies

Continuing Engineering Education

Marc GOOSSENS, M.Ph.Sc. (Physicist Engineer)
Executive Director of SEII
(European Society for Engineers and Industrialists)
Member of the Council of IACCE
(International Association for Continuing Engineering Education)

SEII

IACCE

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Having enough Engineers, properly educated and trained their whole life long, is the guarantee of a better future
Goals of this webinar:

1. Convince you of the vital role that innovation has been playing and will go on playing in our lives.

2. Convince you that this role will more and more concern (continuing) engineering education.

3. Convince you to get involved as much as possible in the development of innovation in engineering.
A (convincing) line of argument

A. Why we have to continually innovate
B. How the innovative process has evolved
C. Why technology is so important
D. What is waiting for us in a near future
E. The 6 forces that act on the innovation process
F. Why Continuing Engineering Education is very much concerned by innovation
A. Why we have to continually innovate ("Innovate or Die")

1. The Second Law of Thermodynamics
2. The Red Queen Hypothesis
A.1. The second law of thermodynamics (or law of entropy)

The Second Law of Thermodynamics

Entropy is a measure of the disorder in a system. All systems gain entropy over time.

The Second Law of Thermodynamics says that the total entropy of both a system and its surrounding will NEVER decrease.
In other words:

*If a system creates order for developing itself …*

… it has to ‘create’ more disorder in his immediate environment.
And therefore:

As this ordered system can only subsist through feeding itself from its environment, it has to develop new capabilities in order to overcome the growing disorder of this environment.
A.2.a. The Red Queen Hypothesis

This hypothesis was inspired to the American biologist Leigh Van Valen by the statement that the Red Queen made to Alice in Lewis Carroll’s “Through the Looking-Glass”:

It takes all the running you can do, to keep in the same place if you want to get somewhere else, you must run at least twice as fast as that! — The Red Queen
A.2.b. The Red Queen Hypothesis

Prof. Van Valen
"Red Queen Hypothesis"

The need to constantly evolve in order to stand still relative to a surrounding ecosystem

Market

Pay per use
Focus on core
Economies of scale
Speed to market

... then again you have no choice ...

Transition Costs Vs Operational Disadvantage

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B.1. How the innovative process has evolved

List of 815 ‘innovative’ events, from the formation of the earth to the present (2015):

- $T =$ time to 2100 (years)
- $t =$ time to next event (years)
B.2. How the innovative process has evolved
C.1. Why technology is so important

Martin Heidegger’s and Maurice Merleau-Ponty’s explanations
C.2. Why technology is so important

“When an inner situation is not made conscious, it appears outside of you as fate.”

Carl Jung

“Man without technology... is not man”

Ortega y Gasset (1939)
D. What is waiting for us in a near future

1. The impact of robotization and computerization on future jobs

2. Another relationship towards acquisition of non-basic knowledge
D.1.a. The impact of robotization on future jobs

The position of industry is quite clear:

#1 Transformation will happen
#2 If it can be done, it will be done
#3 If you don’t do it, someone else will

Wait + See
Please make me irrelevant

Everything that can be automated will be automated.

— ROBERT CANNON, INTERNET LAW AND POLICY EXPERT
D.1.b. The impact of computerization on future jobs

A study by Carl B. FREY & Michael A. OSBORNE (September 2013):
“The future of employment – How susceptible are jobs to computerisation?”
D.2. Another relationship towards acquisition of non-basic knowledge

From:

ONE (professor, teacher, expert, …)

MANY (networked knowledge providers)

To:

MANY (students, learners, …)

ONE (knowledge seeker)
E. The 6 forces that act on the innovation process

1. **Commoditization**: knowledge has to be something that can easily be accessed.

2. **Digital revolution**: more and new knowledge

3. **Social mediatization throughout society**: knowledge becomes a social need

4. **Globalization**: knowledge without border

5. **Turbulent world**: knowledge as a solution to problems

6. **Acceleration**: or running faster to stay in the same place

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(1) By Langdon MORRIS, co-founder of Innovation Labs LLC
F. Why CEE is very much concerned by Innovation

Fast changes in technologies and in the economic context, together with the evolution to higher responsibilities, will force professional engineers to continually acquire additional competencies.

Higher Education Institutions cannot (any more) provide students with the necessary competencies for ‘jobs’ that, either don’t exist yet or will drastically evolve.
Organized by engineering organizations, this international event will be the place to discuss the current state and best practices and foresee the future of continuing professional development (CPD). Major stakeholders are invited and interaction is sought to write the history of the future of CPD. The format of the conference will provide plenty of occasions to hear everyone’s opinion and to exchange ideas and plans. Take part in shaping the future of CPD on a global stage with one of the world’s only international organizations devoted to CPD global stage. Take advantage and visit Porto a city that has been chosen as #1 best destination in Europe in 2014.
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