



INNOVATION IN CONTINUING PROFESSIONAL DEVELOPMENT: A VISION OF THE FUTURE

PORTO, PORTUGAL | MAY 17 - 20, 2016



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Ensuring CPD
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Envisioning CPD
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Stakeholders Next
Steps



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



Universidade do Porto
FEUP Faculdade de
Engenharia



Innovations in Continuing Engineering Education

*A webinar hosted by the IACEE
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 IACEE

marc-goossens@skynet.be



SEII
European Society
for Engineers &
Industrialists



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 IACEE
(International Association for Continuing Engineering Education)

Member of :



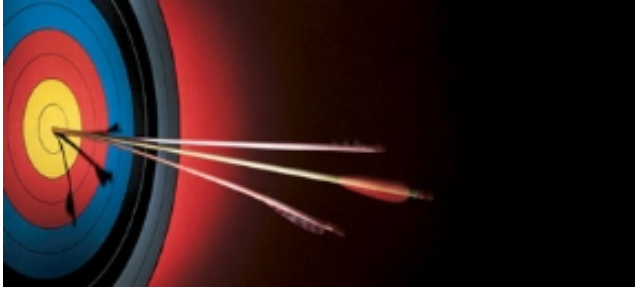
European Society for Engineering Education
Europäische Gesellschaft für Ingenieur-Ausbildung
Société Européenne pour la Formation des Ingénieurs

marc-goossens@skynet.be



*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.

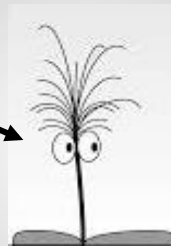
The Second Law of Thermodynamics says that the total entropy of both a system and its surrounding will NEVER decrease.





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

RED QUEEN HYPOTHESIS



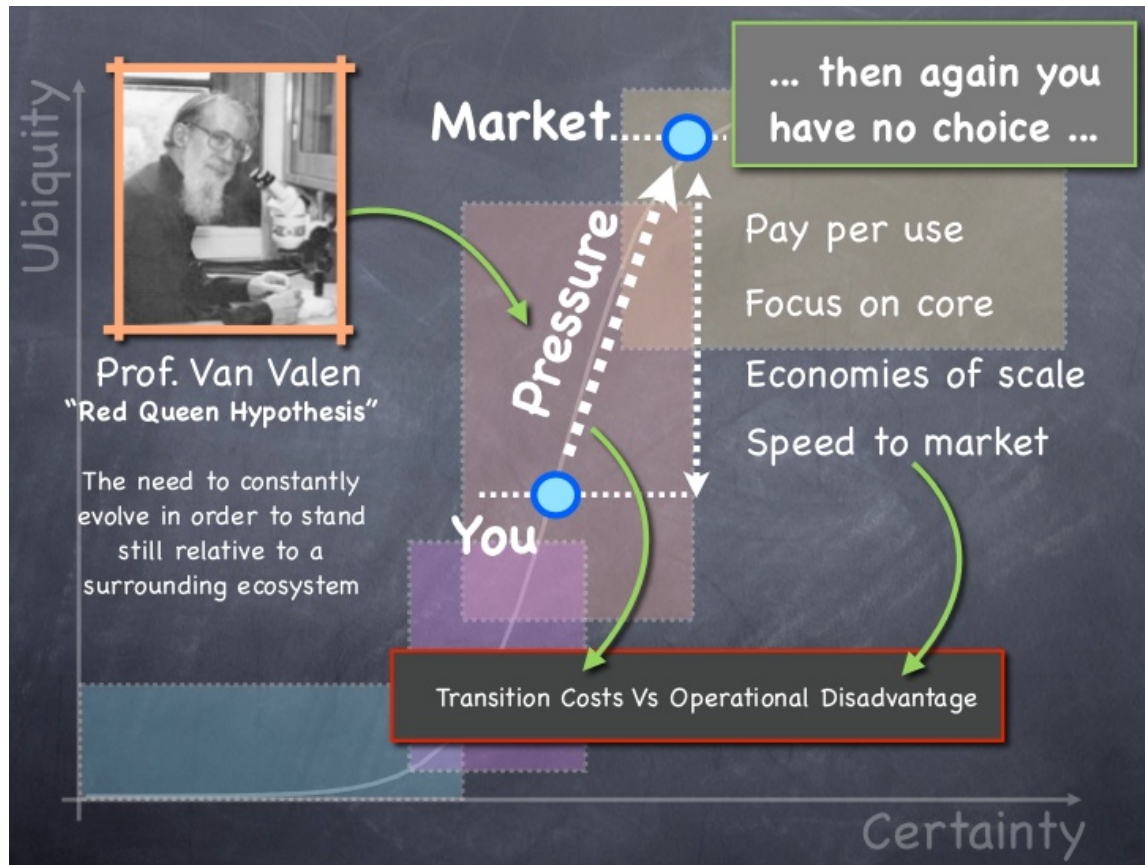
IN REFERENCE TO AN EVOLUTIONARY SYSTEM,
CONTINUING ADAPTATION IS NEEDED IN ORDER
FOR A SPECIES TO MAINTAIN ITS RELATIVE FITNESS
AMONGST THE SYSTEMS IT IS CO-EVOLVING WITH

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



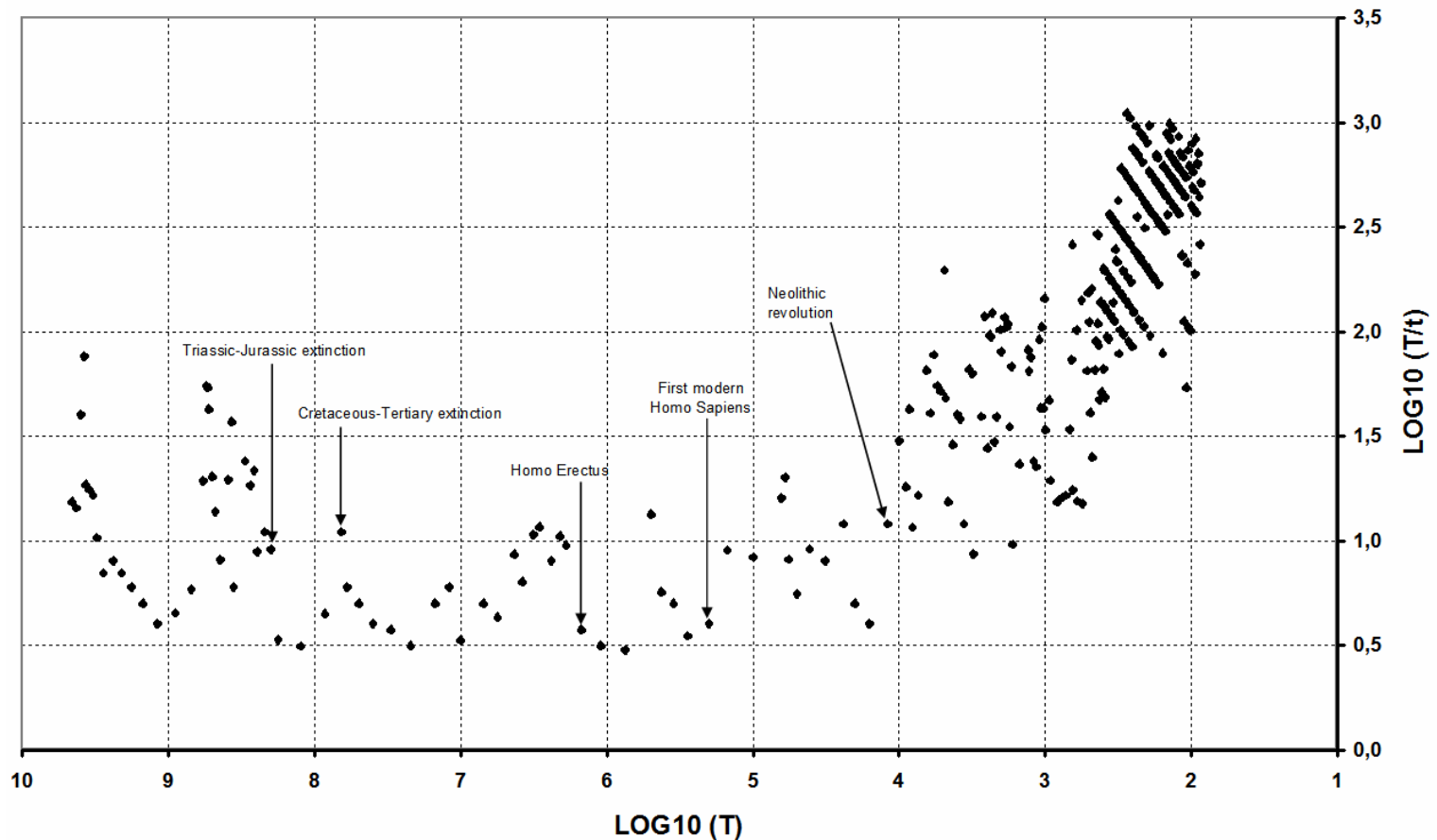


B.1. How the innovative process has evolved

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

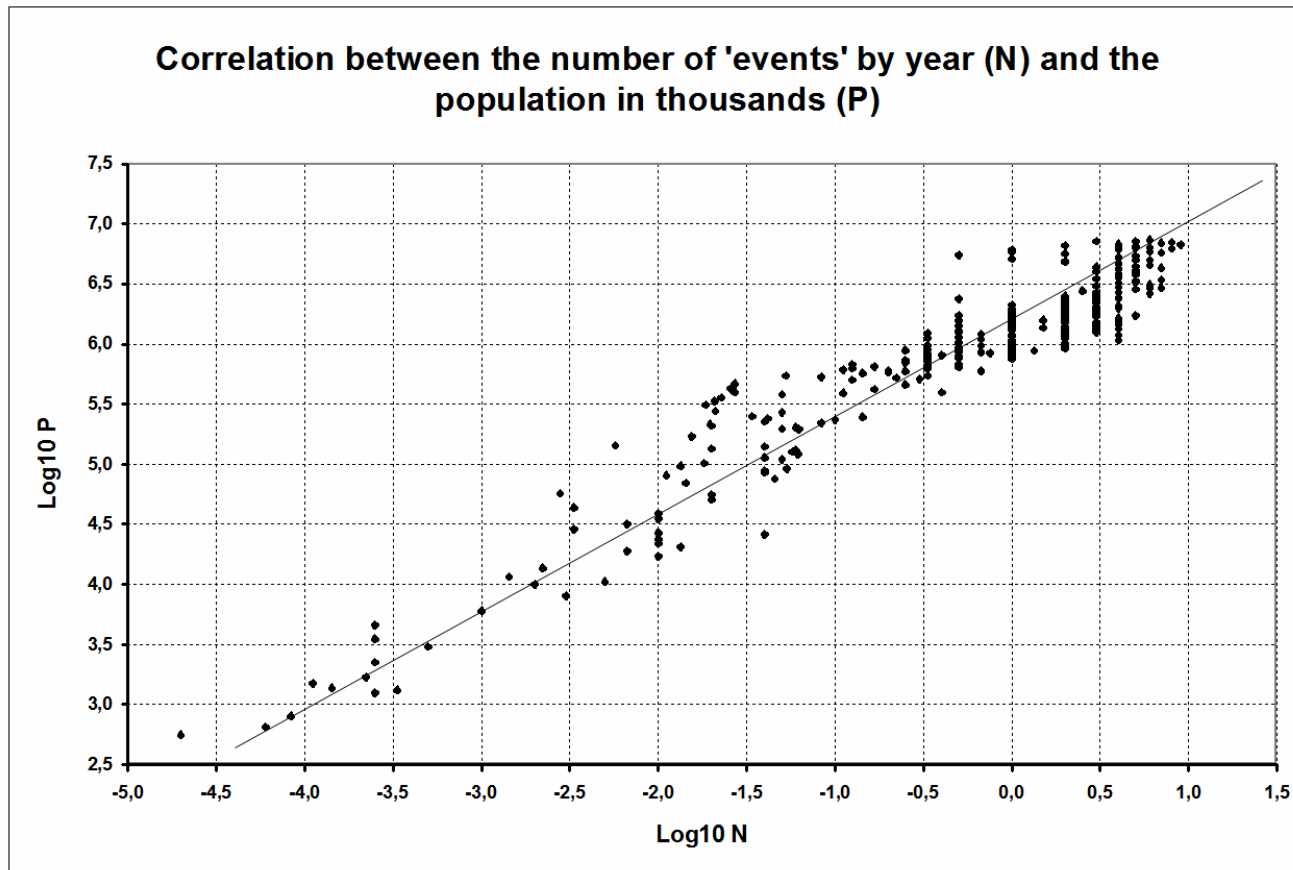
T = time to
2100
(years)

t = time to
next event
(years)



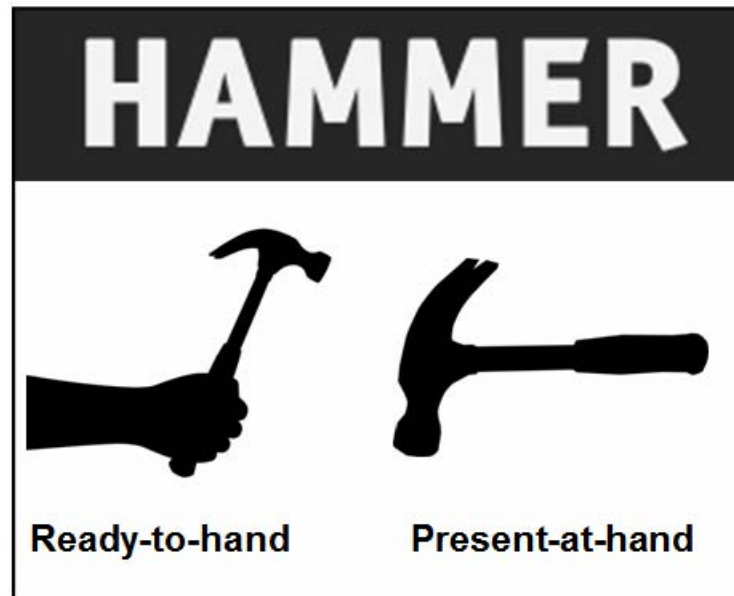


B.2. How the innovative process has evolved



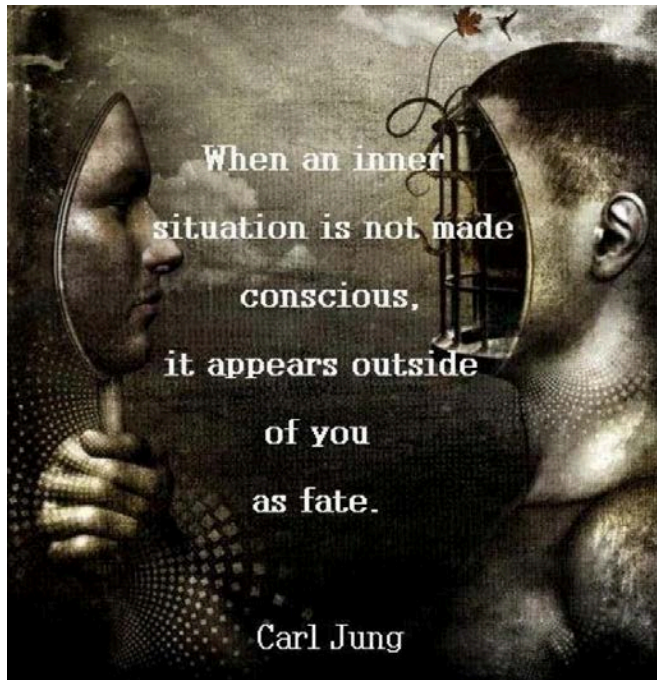


C.1. Why technology is so important



Martin Heidegger's and Maurice Merleau-Ponty's explanations

C.2. Why technology is so important



“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 :

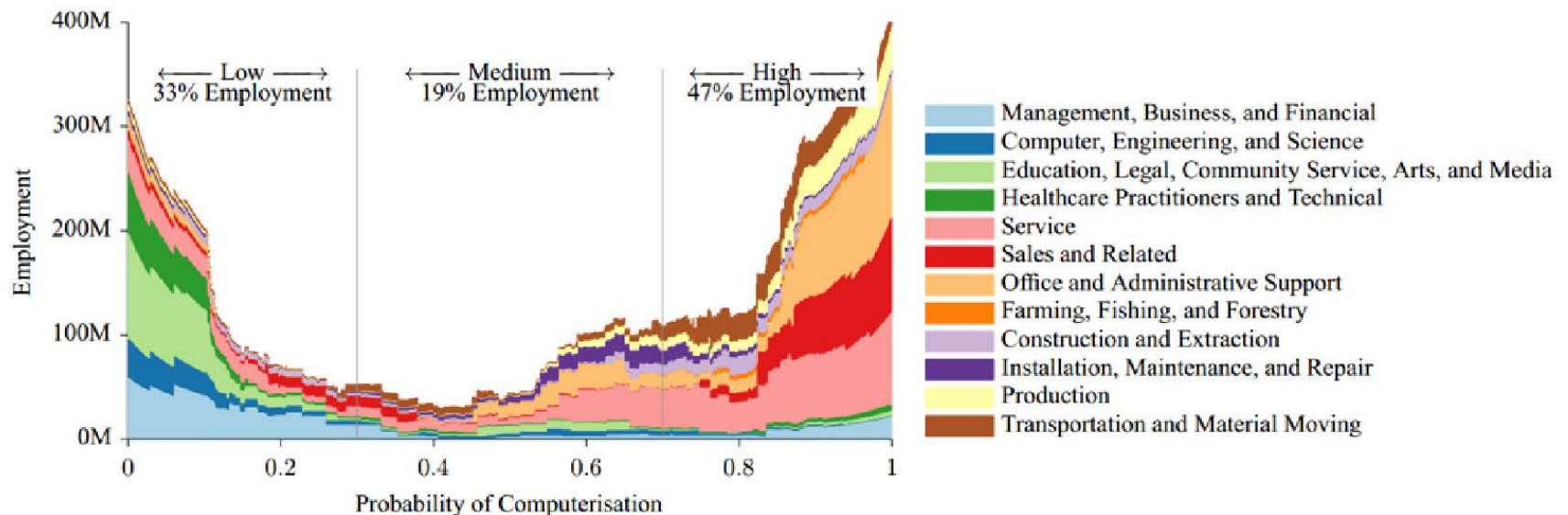




D.1.b. The impact of computerization on future jobs

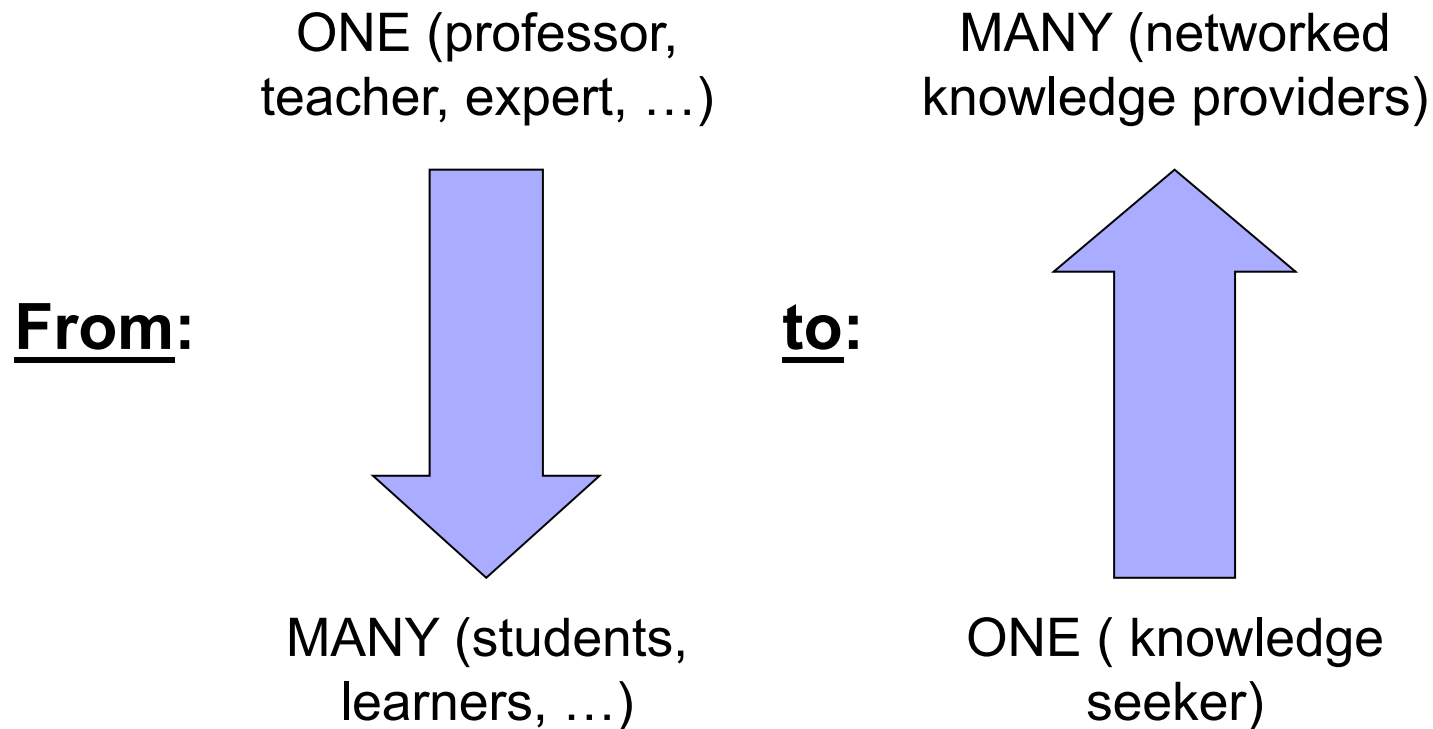
A study by Carl B. FREY & Michael A. OSBORNE (September 2013):

“The future of employment – How susceptible are jobs to computerisation?”





D.2. Another relationship towards acquisition of non-basic knowledge





E. The 6 forces that act on the innovation process ⁽¹⁾

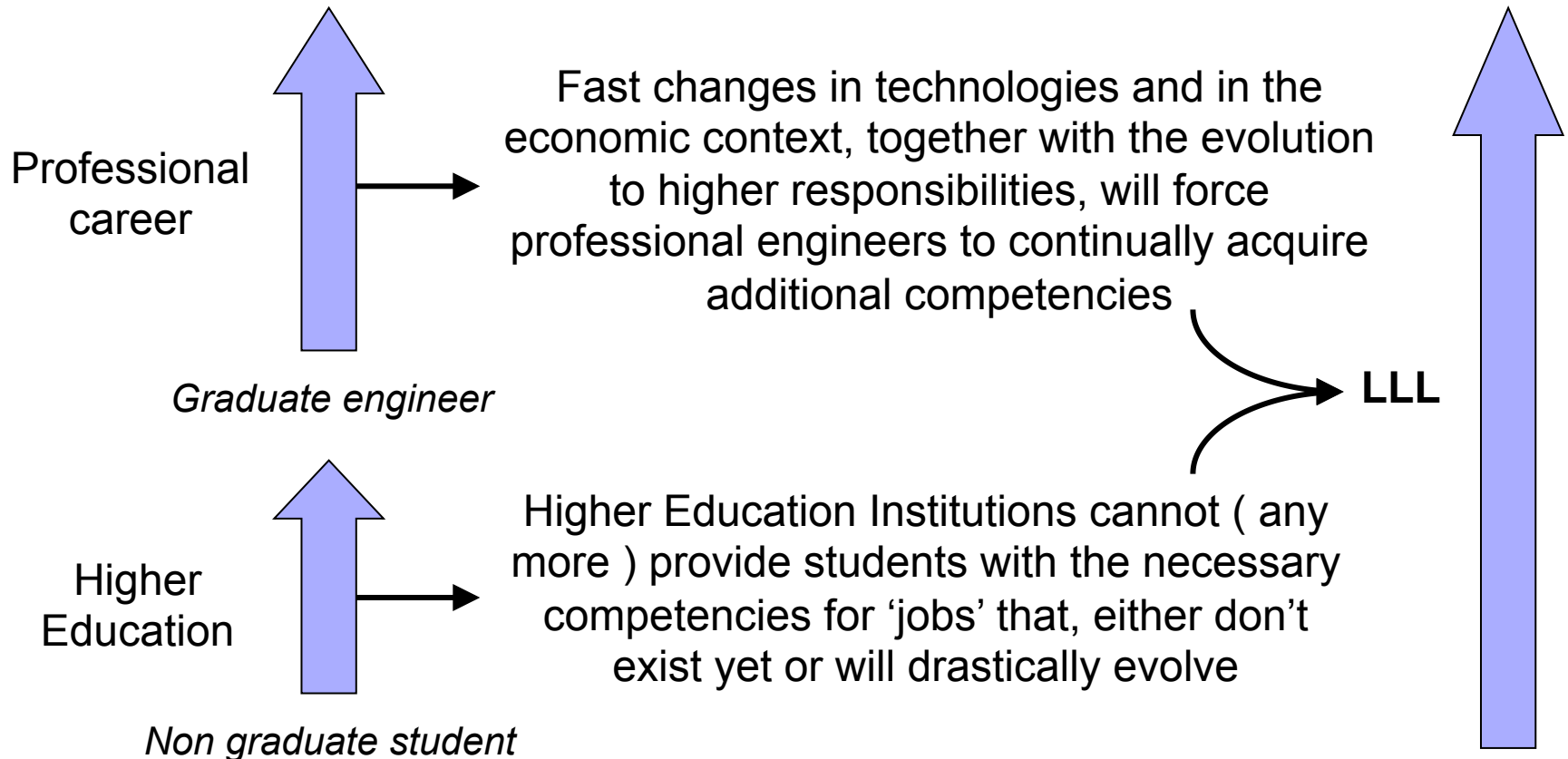
1. **Commoditization** : knowledge has to be something that can easily be accessed.
2. **Digital revolution** : more and new knowledge
3. **Social mediatization throughout society** : knowledge becomes a social need
4. **Globalization** : knowledge without border
5. **Turbulent world** : knowledge as a solution to problems
6. **Acceleration** : or running faster to stay in the same place

(1) By Langdon MORRIS, co-founder of Innovation Labs LLC





F. Why CEE is very much concerned by Innovation





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Any question ?





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