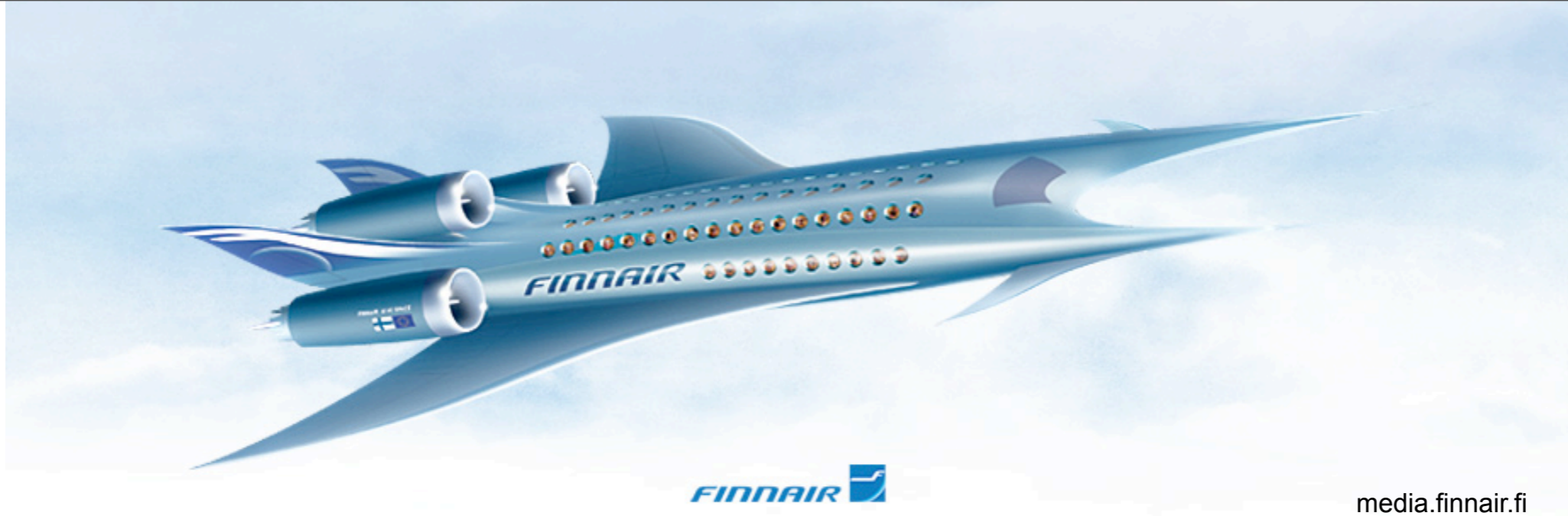


Case Aalto University - **new models** in **learning** and **education** for **innovations**

CAEST/HAE Symposium
Innovative Approaches to Engineering Education

27.6.2013
Matti Raevaara
Vice President, Aalto University



media.finnair.fi



noriukeliauti.lt



blogitfinnair.inoob.fi



WWW.GRAPHIQUE3D.REPUBLIKA.PL

http://www.retrohive.com/images/scifi_wallpaper12.jpg

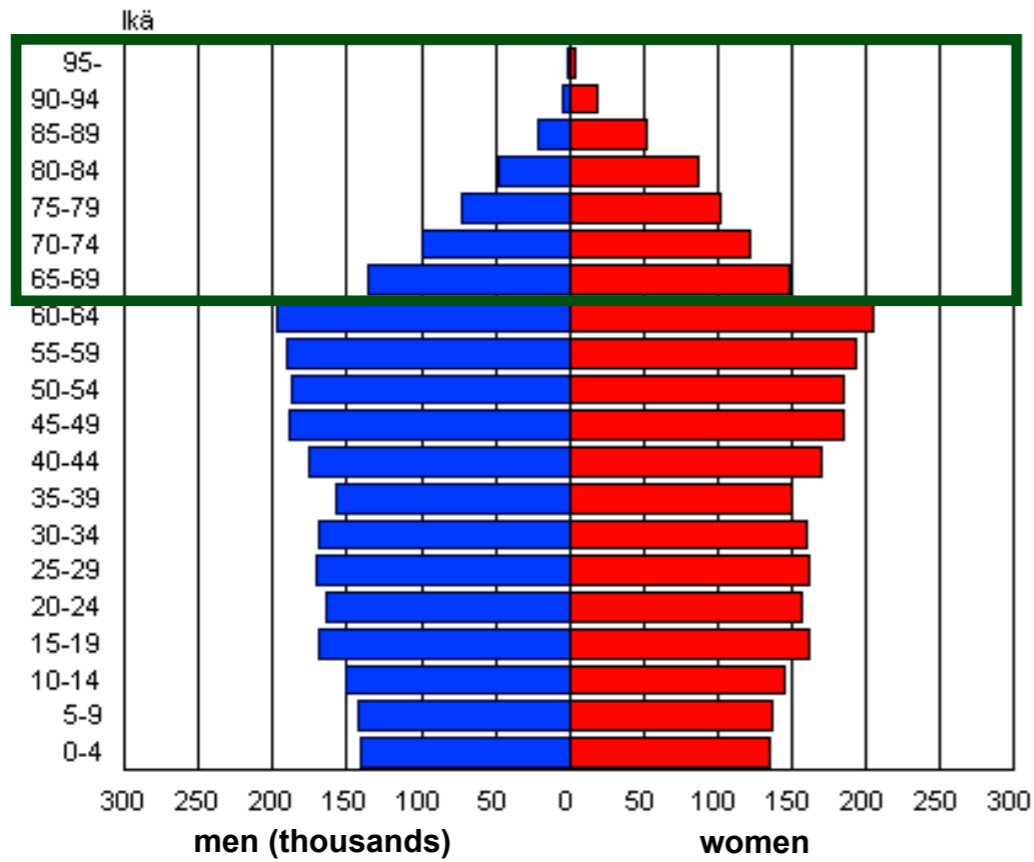


Martti Raevara 2011: Otaniemi

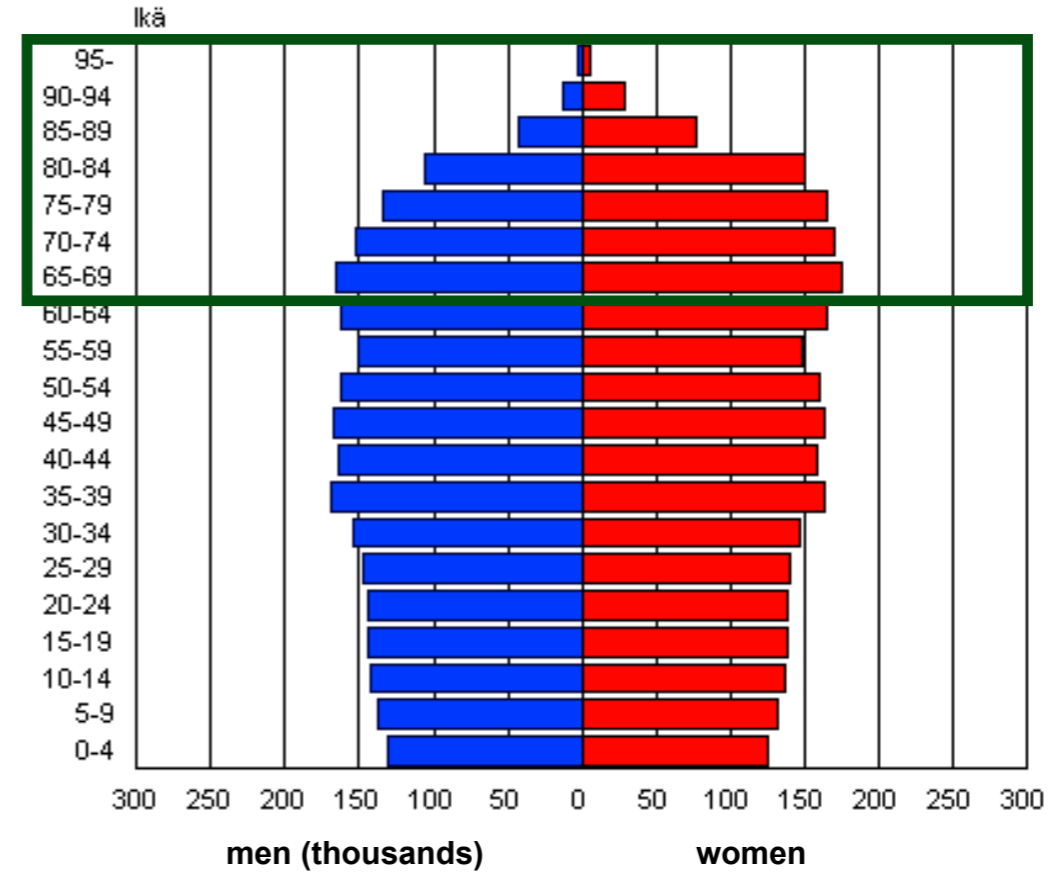
Otario School of Art and design
Canada

Image by: Photo by Taxiarchos228

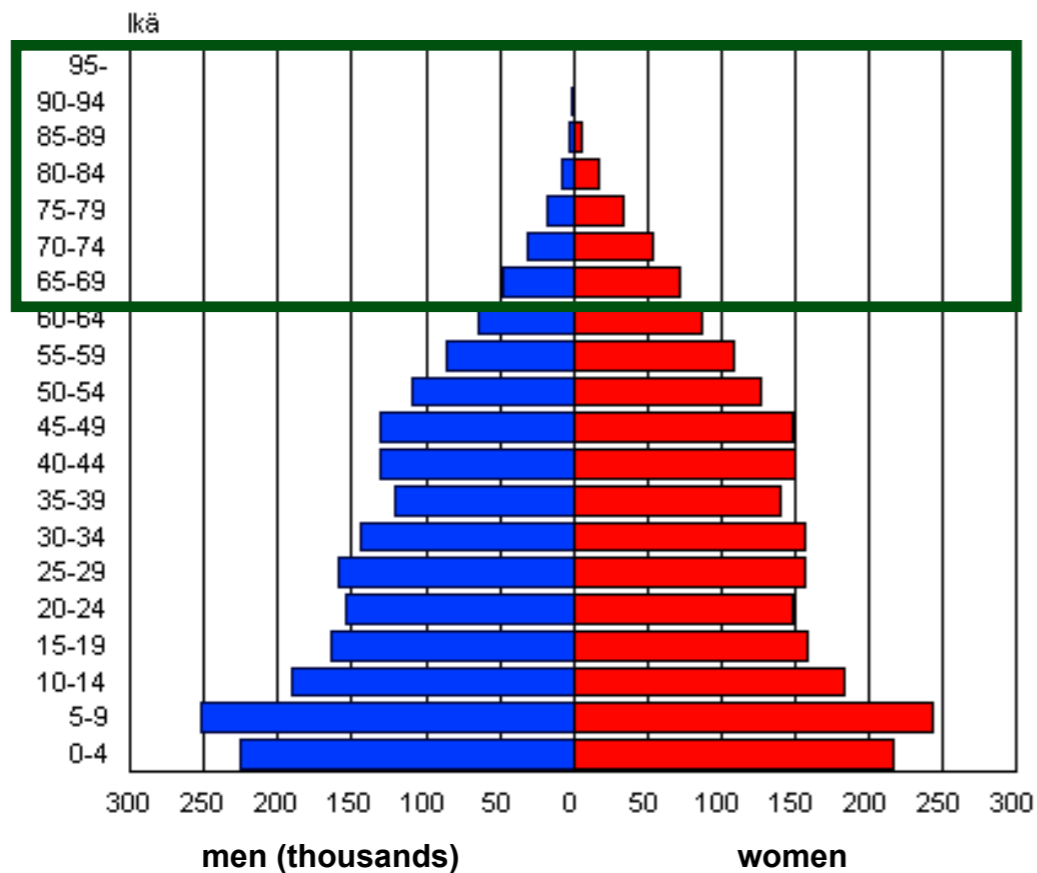
2010



2030



1955



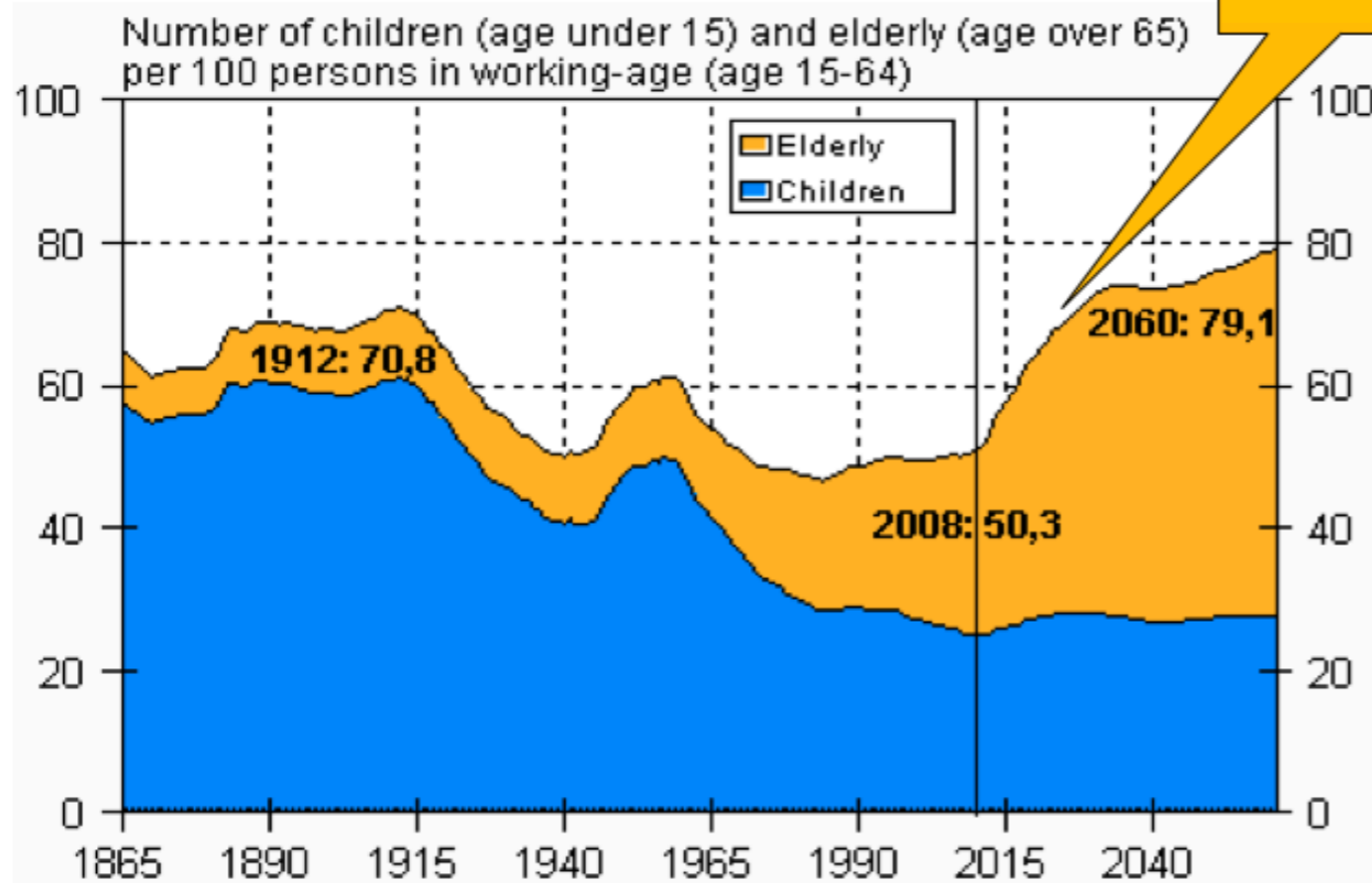
Age pyramids of Finland

Tilastokeskus, <http://www.stat.fi/tup/verkkokoulu/data/vt/05/08/index.html>

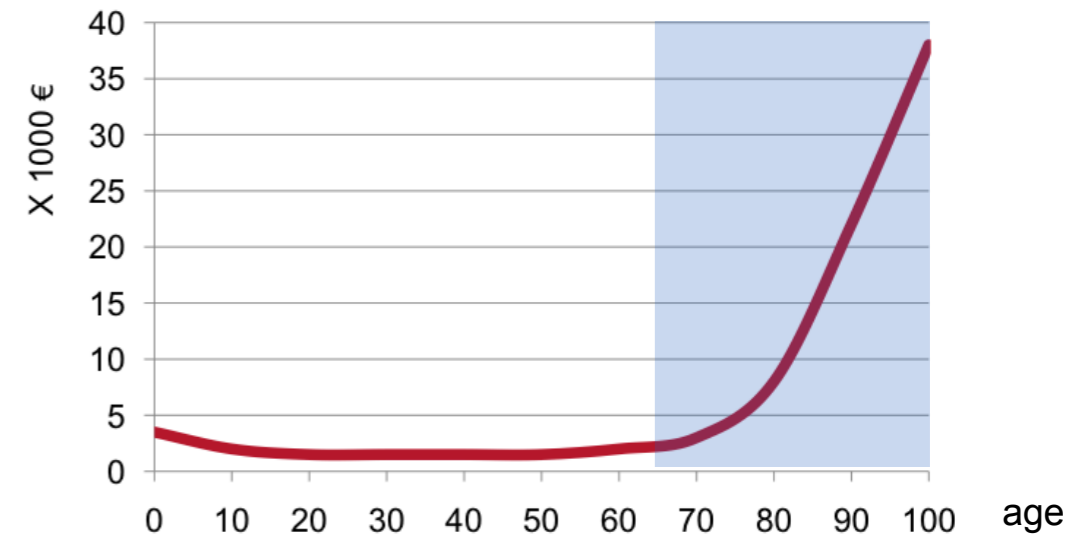


Maurizio Cattelan:
Untitled, 2002

Huoltosuhte/ Dependency ratio in Finland (Statistics Finland 2009)



Municipal social and health care expenses by age
(source: STM)



Situation in Finland will be 2030

- 65+ increase x 2 -> **1/3 of population 2060**
- 80+ increase x 3
- people with dementia increase over x 2
- dependency ratio **50/100 -> over 70/100** (2030)
- **social and health care staff/ labour force** \approx **15% -> 25%**
 - during next 10 years 30% will retire

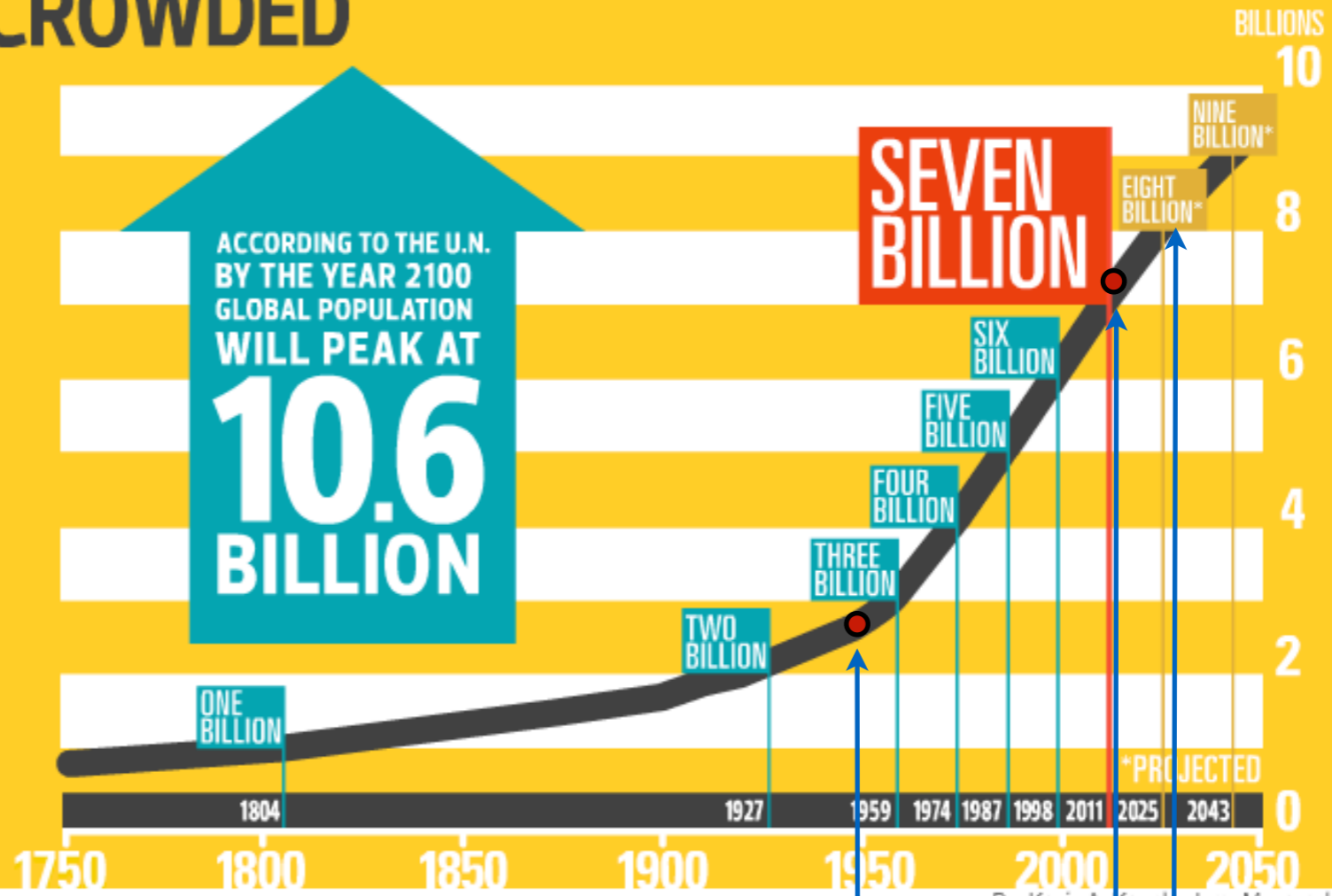
Finland is the first (western) country, where

- are more pensioners, children, students and unemployed persons than working people
- **aging based expences increase fastest in EU**

A WORLD OF 7 BILLION...AND COUNTING

WORLD MORE CROWDED

IT TOOK FROM THE FIRST HUMAN UNTIL 1804 FOR THE WORLD POPULATION TO REACH 1 BILLION. IT TOOK JUST 207 MORE YEARS TO HIT 7 BILLION, WHICH HAPPENED THIS YEAR, ACCORDING TO THE U.N.



Sources: 2011 Population Reference Bureau

By: Kevin A. Keppke, Jerry Mosemak, Paul

2011 +78 milj.
 ≈ Germany population now (82)

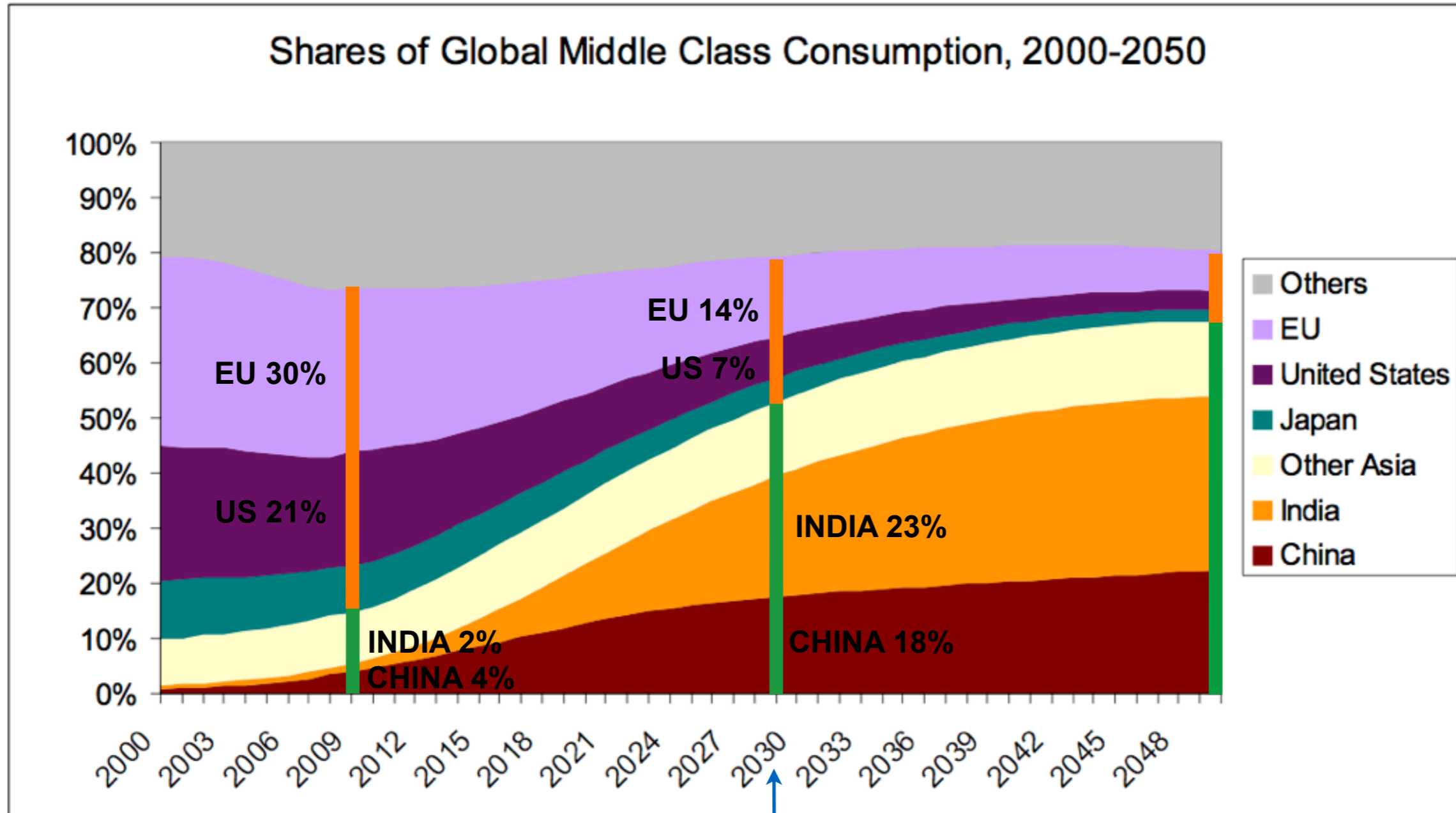
2021 (10 years) + 600 milj.?
 ≈ over EU population now (502)

1955
2,7 billion
 Martti

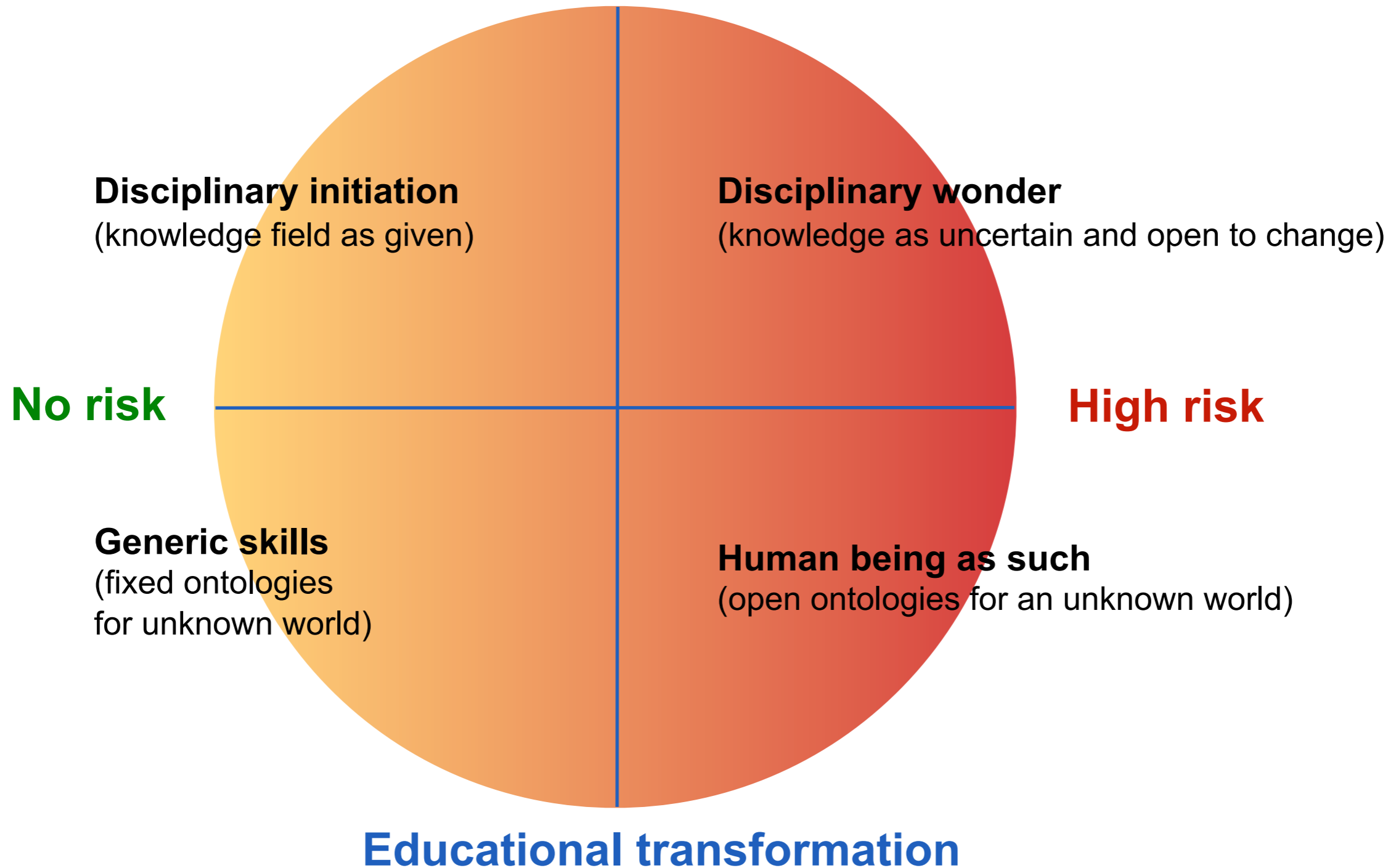
2012
7 billion
 Peetu

2030
8 billion?
 Peetu 18

Figure 7. India and China Make Waves in the Global Middle Class



Educational development



Roland Barnett 2004: Learning for an unknown future

Aalto University



Where *Science* and *Art* meet *Technology* and *Business*

- Part of **Finnish university reform 2010**->
 - More freedom to implement own strategy and organization
 - New personnel structure and freedom to use new resources
- **New unique combination:** art and design + business + technology
- **Main campus in Otaniemi:** new building for ARTS, Bachelor education center, metro, library renovation for learning center,...
- **Foundation based university, significant increase in resources**
 - Direct government funding + 80 M€/y extra for starting process (up to 2015)
 - Total annual budget about 400 M€
 - Endowment 700 M€ (200 + 500)
 - Estates 300 M€

How to make quality step happen 2020 ?

High-level research (RAE) and art & design outcomes and activities

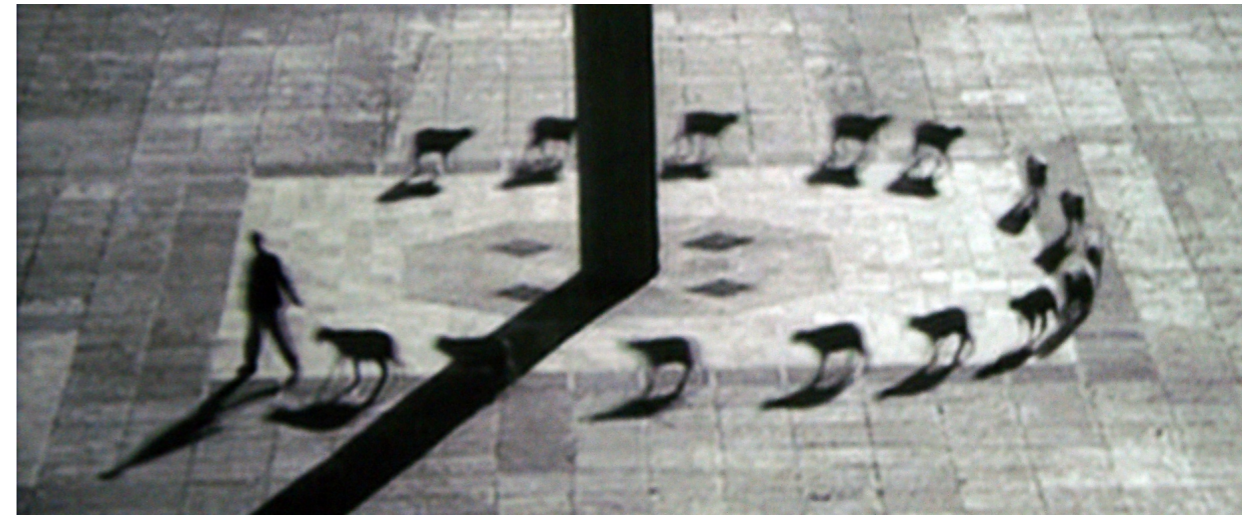
- **Tenure Track**, artist in residence

Excellence in education (TEE)

- **Learning on focus**

International context - think global

- **Master programmes in English**
- **Student & teacher recruitment and exchange**
- **Tenure Track**



Francis Alys, Cuentos Patrioticos, 1997-1999

Professional leadership

- enabler and supporter

Professional services and IT

- time for core activities

Infrastructure

- environments for research, art & learning

Multidisciplinary collaboration as resource

- Aalto Factories, projects, programmes,...

Innovations and entrepreneurship

- ACE, Venture Garage, AES

Co-operation, partnerships

Tenure track – most important investment

Aalto University is attractive (August 2012)

	Appointed professors				Applications to these positions		
	#	% Foreign	% Female	% External	#	% Foreign	% Female
ALL	83	33 %	19 %	46 %	1 774	74 %	18 %
<i>Tenure track</i>	69	32 %	20 %	49 %	1 537	75 %	16 %
<i>PoP</i>	14	36 %	14 %	29 %	216	68 %	32 %

Statistics April 2013

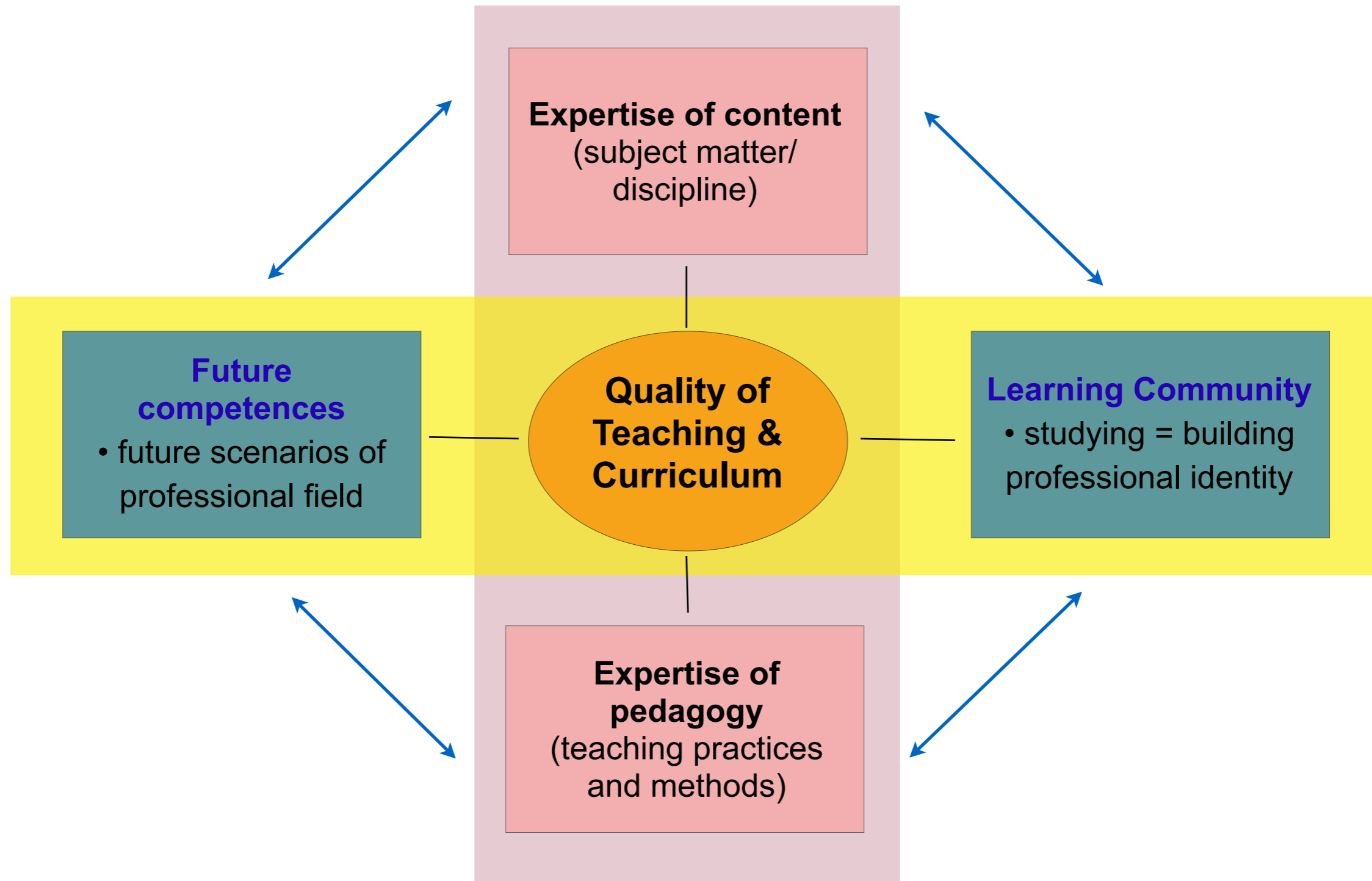
- 200 tenure track positions opened
- 110 appointed
 - > 70% international applicants
 - 30% appointed international
 - 20% female

Rethinking learning and education

- **Curricula based on future scenarios/ competences**
- **Learning-centered culture**
 - teaching **methods** & learning **environments**
 - first year studies on focus
- **Crossing borders** - diverse expertise as resource
 - **interdisciplinary co-operation**, mobility
 - diversity and risk taking
 - innovations and **entrepreneurship**
- **Bachelor and master degree reforms**
 - Bachelor education centre
- **Excellence in teaching**
 - pedagogical education part of tenure track
- **Visionary education leadership**
- **Students as members** of university **community**



Quality of teaching and Curriculum



Future Work Skills 2020

While all six drivers are important in shaping the landscape in which each skill emerges, the color-coding and placement here indicate which drivers have particular relevance to the development of each of the skills.

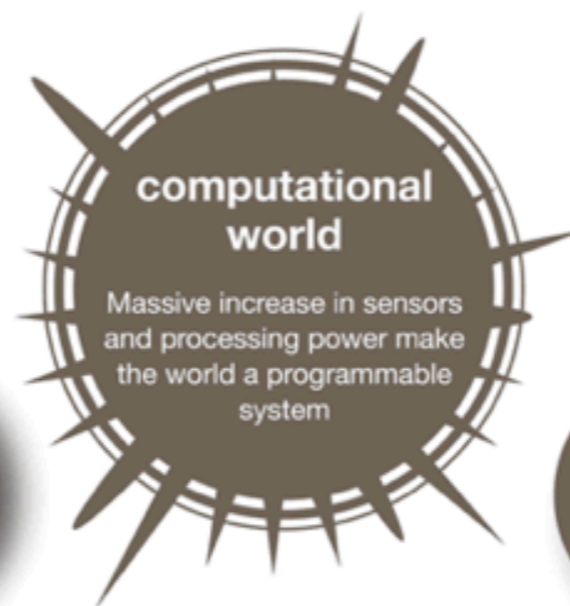
KEY



Drivers — disruptive shifts that will reshape the workforce landscape



Key skill needed in the future workforce



Synergy and crossing borders

– inspiring examples and good practices promoting change

- **Factories** (DF, MF & SF)
 - Global Design Factory Network: Shanghai, Melbourne, Santiago Chile,...
- **Aalto multidisciplinary courses**
 - annual call for pilots
- **Aalto joint Master programs**
 - IDBM, CS 2010 ->
- **Aaltonaut** - integrated Bachelor program, starting as minor 2013 ->
- **Aalto Venture Program**
 - starting as minor 2013- >
- **funding model** for minors and courses to support students mobility
- **experimental learning spaces**
 - DF & MF, ADDLab, Riihi, Venture Garage, learning hubs,...



Martti Raevara, Shanghai 2010



Design Factory concept

- symbiosis of state-of-the-art conceptual thinking and cross-disciplinary hands-on-doing in collaborative environment



Design Factory

'Starter Kit'

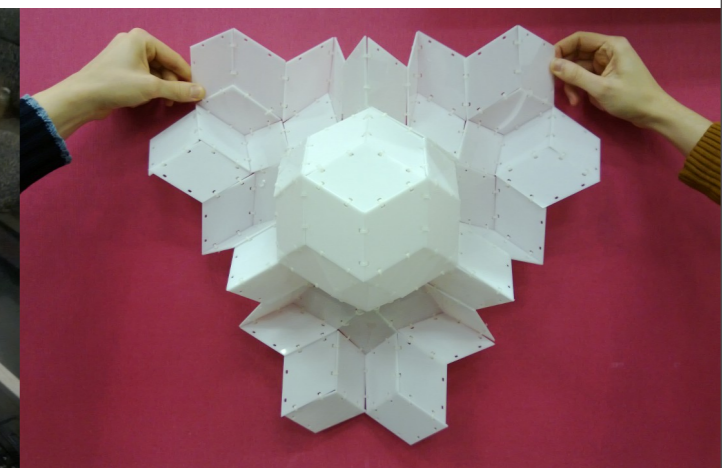
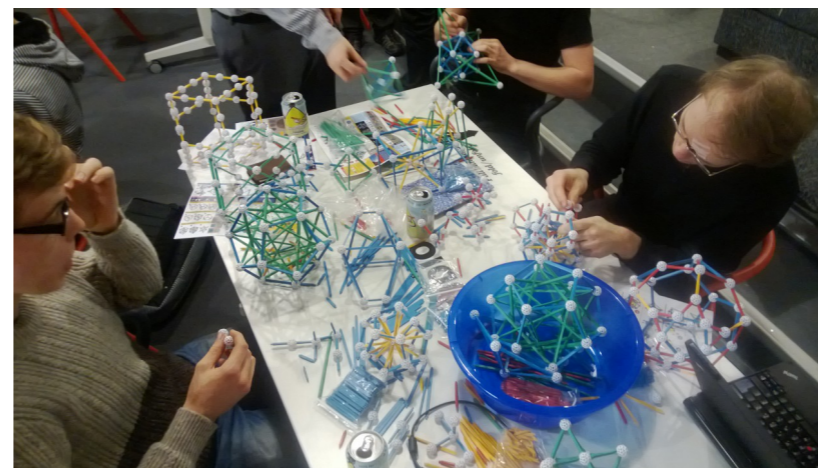
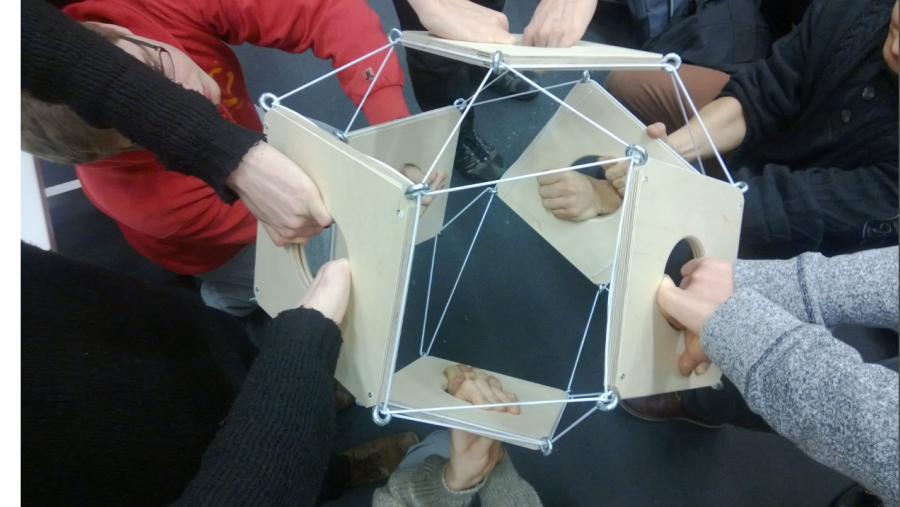
Our philosophy of Creation:

Design Factory toolkit vol 1.0

- ▶ Be **INTERESTED**
- ▶ Get your **HANDS DIRTY**
- ▶ **COMMUNICATE** your ideas
- ▶ Get it **DOWN**
- ▶ **BUILD** on others ideas
- ▶ **QUICK** 'n' dirty
- ▶ **DEMO** or die
- ▶ Keep up the **PACE**
- ▶ Have **FUN!!!**



Crystal Flowers in the Halls of Mirrors: Mathematics Meets Art and Architecture



Photos: Jesper Jokilehto ©, 2013

<http://www.youtube.com/watch?v=XiFyBI6Pn8I>

<http://www.youtube.com/watch?v=EzhloVI3w04>

<http://www.youtube.com/watch?v=fwVwZnYTWNI>

Students' active role = co-creation

- **Students key actors in reforms** - trust, support, freedom and responsibility
- **Aalto Entrepreneurship Society** - <http://aaltoes.com>
- **Startup Sauna** - <http://startupsauna.com>
- **Aalto Global Impact** - <http://aaltoglobalimpact.org>
- **Aalto on Tracks** - <http://aaltoontracks.com>
- **Aalto on Waves** - <http://www.aaltoonwaves.com>



<http://startupsauna.com/en/>



Dear startups,
We don't mentor - we coach.



<http://slush.fi/en-gb/>

Tough feedback with love.
Iterate and pivot, above all.

Slush 2012 is live now!

Watch the live stream at

- ▶ slush.fi/stream
- ▶ livestream.com



Who will be at Slush?

Some of the most respected international investors and media visit Slush to look for the next in tech from the home region of Nokia, Skype and Linux.

MEDIA



INVESTORS



[VIEW ALL INVESTORS](#)

Creating new learning hubs by & for students

Sundeck, Greenhouse, Living room,... 14 hubs so far
-> new hubs in progress

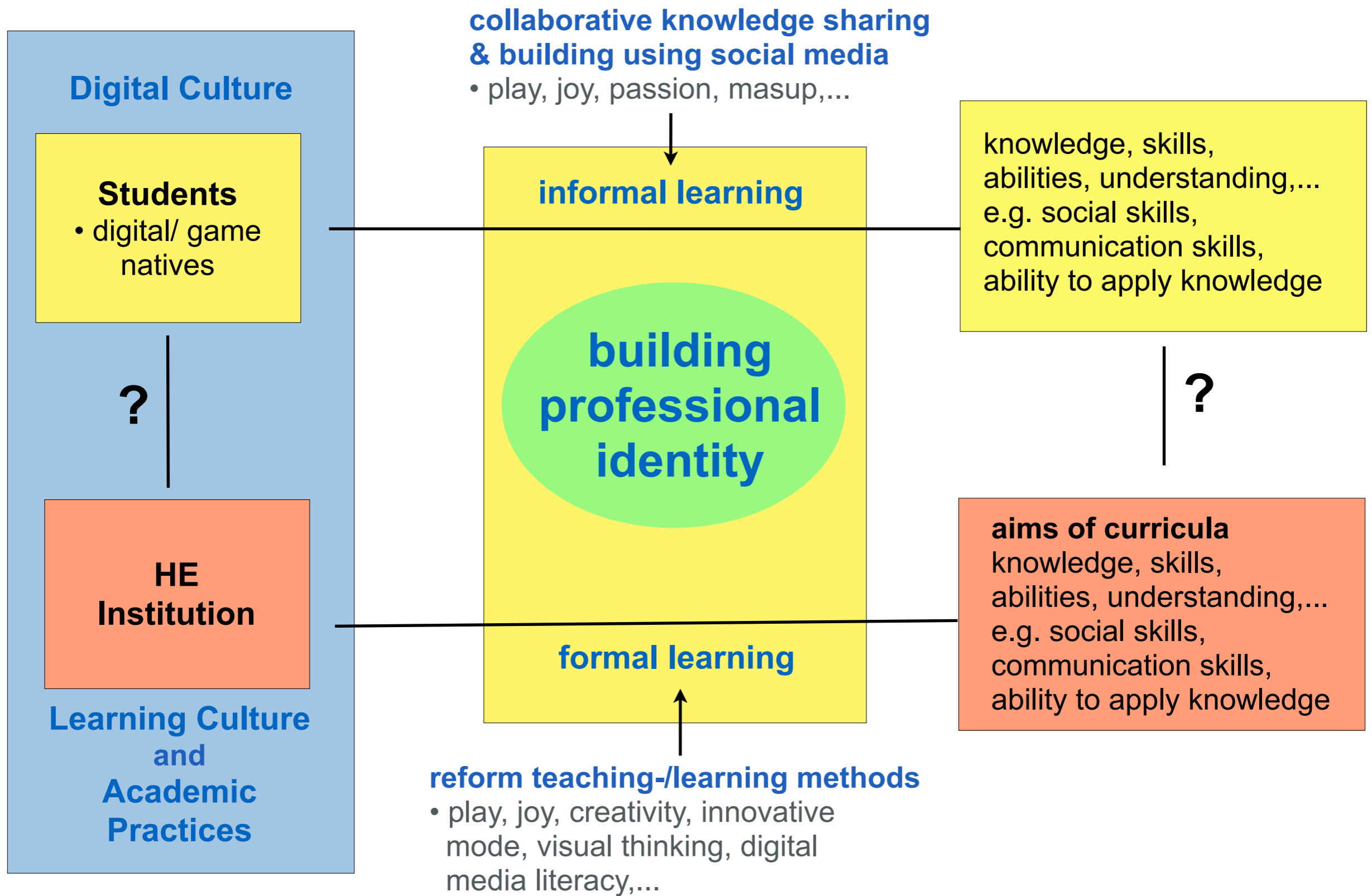


TALK TO SOMEONE



Learning hubs: **Greenhouse**, 2013 (T-talo, SCI, Otaniemi)

kuvat: Heikki Juutilainen



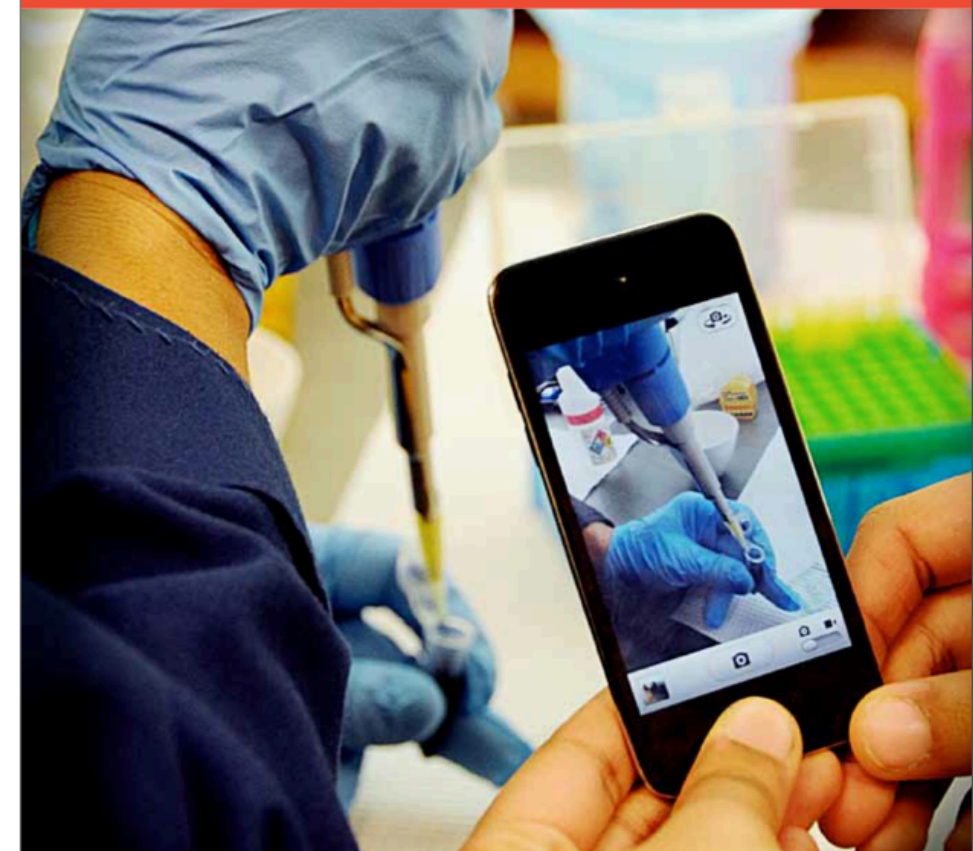
The Horizon Report 2012 (NMC)



Horizon Report > 2012 Higher Education Edition

Key trends 2012

- **educators in sense-making and coaching**
- people expect to be able to **work, learn and study whenever and wherever**
- education paradigms are shifting to include **online learning, hybrid learning** and **collaborative models**
- more emphasis on **challenge-based learning**
- **work of students** is increasingly **collaborative**



<http://www.nmc.org/pdf/2012-horizon-report-HE.pdf>

Significant challenges

- learning in HE challenge **libraries to reforms**
- **new scholarly forms** of authoring and publishing continue to emerge
- **appropriate metrics for evaluating** them increasingly **lag behind**
- **digital media literacy** as key skill in every discipline and profession

ADDLab - over 100 h open lectures on web

mapping new
landscape of
digital design

<http://addlab.aalto.fi>

ADD THOUGHT
ADD ARCHIVE
ADD METAPHYSICS

22.11. ADD THOUGHT 10: ENRIC RUIZ-GELI
By ADDLAB.

ADD THOUGHT 11 EVENT POSTPONED UNT...
By ADDLAB.

11.10. ADD THOUGHT 9: TESTA/WEISER
By ADDLAB.

27.9. ADD THOUGHT 8: HERNAN DIAZ ALO...
By ADDLAB.

07.05. ADD THOUGHT 7: DAVID ERDMAN
By ADDLAB.

26.04. ADD THOUGHT 6: KLAUS BOLLINGE
By ADDLAB.

23.04. ADD THOUGHT 5: MICHAEL SPEAKS

12.04. ADD THOUGHT 4: ANDREW WITT
By ADDLAB.

30.01. ADD THOUGHT 3: GREG LYNN
By ADDLAB.

1.
Q: WHAT DOES 'DIGITAL DESIGN' MEAN TO YOU?

ADDLAB.
Andrew Witt

ADD Andrew Witt Question 1.mp4
from ADDLAB PLUS

00:58 HD vimeo

ADD enric ruiz-geli question 5.mp4
from ADDLAB PLUS 3 weeks ago

Follow + Add to... Stats Download Switch to HTML5 Player

ADD David Erdman Question 1.mp4
from ADDLAB PLUS

01:16 HD vimeo

ADD Michael Speaks Question 1.mp4
from ADDLAB PLUS

02:30 HD vimeo

ADD Steven Ma Question 1.mp4
from ADDLAB PLUS

GLOBAL DESIGN LOCAL PRODUCTION
By ADDLAB.

BIOBOX
By ADDLAB.

NANOSHELL
By ADDLAB.

INTERACTIVE MATERIAL
By ADDLAB.

ADD MATERIAL - MANU PROJECT
By ADDLAB.

DDSHAPE (DIRECT DIGITAL SHAPE)
By ADDLAB.

CONVOLUTE
By ADDLAB.

RESPONSIVE SKIN 2.0
By ADDLAB.

CASE STUDY HOUSES
By ADDLAB.

ADD Hernan Diaz Alonso Question 10.mp4
from ADDLAB PLUS 3 weeks ago

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Three of the five days students were covering algorithmic techniques in process specifically writing an algorithm that enables agents to react to one another.

Roland Snooks Interview
from ADDLAB PLUS

Lablife 3D laboratory in Second Life in Aalto Archipelago

- new concept for biotechnology and chemistry education

<https://sites.google.com/site/lablife3d/home>



Decarboxylation



Kangasniemi & Nordström, December 2012

RNA -analysis

crossing borders
with
enriching dialog
& passion based
pedagogy + learning
for better future



Maurizio Cattelan:
Untitled, 2002



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martti.raevaara@aalto.fi