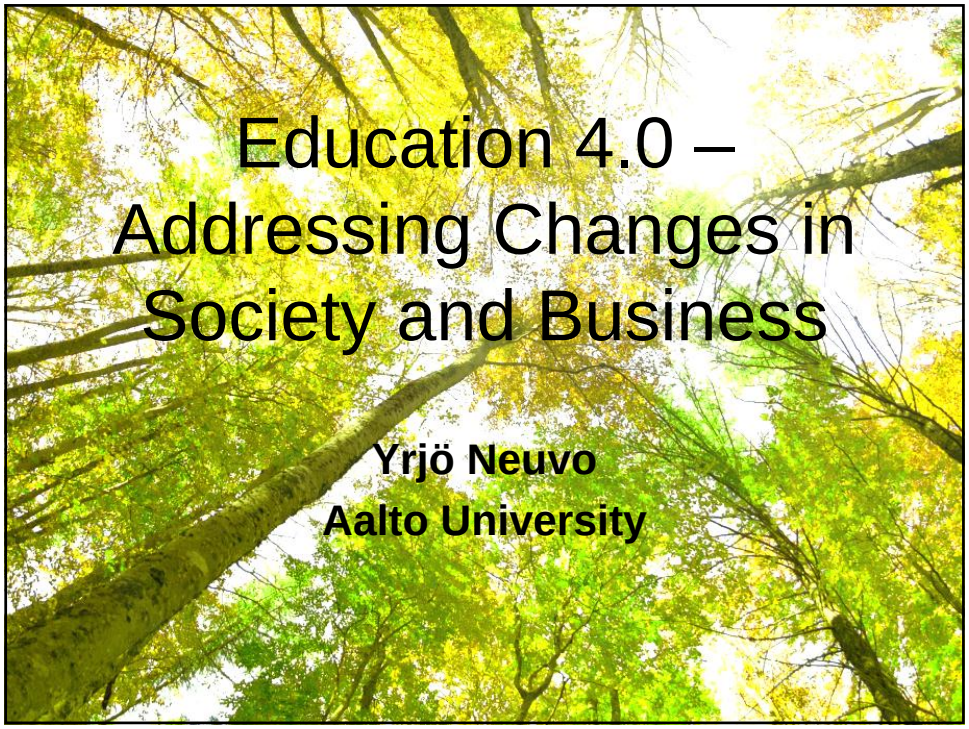
Education 4.0 –
Addressing Changes in
Society and Business
Yrjö Neuvo
Aalto University


Learning the Bigger Picture and Crossdisciplinary Teamwork
- Case Bit Bang
Internet and Education
- Case Education Reloaded
Learning in Knowledge Triangle
- Case European Institute of Innovation and Technology

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Bit Bang 4 – Future of Internet

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Learning aims

- Teamwork skills
- Multidisciplinary collaboration
- Crossing your comfort zone
- Creating an interest in the broader picture
- Skill to produce future scenarios and predicting the unpredictable
- Professional writing skills
- Understanding the impact of the technological change on the society, and vice versa
- Broad domain knowledge on the future developments of the Internet

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Objectives and structure of the course

- Bit Bang is a post-graduate course with
  - Lectures
  - Seminars at the end of the semesters
  - Group work and joint publication
  - Course literature
  - Study tour
- Students will work in multidisciplinary groups
  - Tight co-operation between members is essential!
- Students will produce book chapters describing selected topics
- Size: 10 study credits

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General structure of the year

- Rules
  - Active participation
  - Positive attitude
  - Be radical
  - Be punctual
- Visiting lecturers, excursions
- Writing a book on Future of Internet
- Course books
- Study trip to Tokyo and Osaka / Nagoya

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Joint publication

- Everybody contributes and keeps their schedules
- Clear project management responsibility
- Top down approach
- Make a good plan and set mutual deadlines on the way
- Regular team meetings with tutor
- Cross-review each other's texts
- Do your own thinking, be radical
- Enjoy your work!

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Experiences from Bit Bang cources

Feedback from students is extremely positive

Learning of broader perspectives highly valued (society, industry, globalisation, …)

Teamworking in multidisciplinary and multicultural environments under tight schedules

The course is really fun and rewarding to teach/direct

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Education Reloaded:
The Consequences of the Internet Influencing Human Cognition and Work

Hendrik Hielkema, Somaya Arianfar, Petri Saarikko, Jan Kallenbach, Mohammad Hoque, Yang Deng

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Cognition

- **Cognition**:
  Refers to mental processes such as attention & memory in order to process information (e.g. for analyzing, problem solving, decision making, knowledge creation, etc.)
- **Data**
  - Raw facts, observations, measurements
- **Information**
  - Data in context → Formation of Meaning
- **Knowledge**
  - Processing of Information → Cognition

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Internet as a Tool

- New Technological Features
  - **Integration of media types** (text, images, video, animations)
  - **Content navigation**: Hyperlinks
  - **Interactivity**: Feedback mechanisms between content producer and consumer
- **Advantage**: serves as an external memory
  - Improved efficiency for cognition → abacus/calculator
- **Disadvantage**:
  - Amount of data grows exponentially
  - Complex, fast technological development

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Internet as a Tool

- **Google Effect** → Indications of Cognitive Change in Users
  - When faced with a difficult tasks and questions → People think about computers/the Internet as a helper
  - When people expect to have future access to computers
    - Enhanced recall for **where** data and information can be found
    - Low recall for data and information *itself*
  - The Internet as
    - An all-encompassing **external memory → people rely on it**
    - A **transactive memory** → „information expert“ for group members
- **Dangers**
  - **Loss of long-term attention**, **addiction**, distraction
  - Exposure to **too much data**

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Changes in Work

- **Automation** and massive **outsourcing** of work to Asia
  → information becomes **abundant** = cheap
- **Conceptual Age** → Increasing valuation of intuition, creativity, empathy & artistic thinking
- **Web 2.0**: colaborative tools for unleashing creatively at large
- **Human Interaction Management** and **filters** to augment people's ability to navigate through their daily problem spaces

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Education
Bloom's Taxonomy

		Cognitive Domain	Affective Domain	Psychomotor Domain
		Knowledge	**Attitude**	**Skills**
Knowledge	6.	**Evaluate** (assess in relational terms)		
	5.	**Synthesize** (create, build)	**Internalize value system** (adopt behaviour)	**Naturalization** (automate, become expert)
	4.	**Analyze** (structure, elements)	**Organize personal value system**	**Articulation** (integrate related skills)
	3.	**Apply** (use)	**Value** (understand & act)	**Develop Precision**
Info	2.	**Understand**	**Respond** (react)	**Manipulation** (follow instructions)
Data	1.	**Recall data**	**Receive** (awareness)	**Imitation** (copy)

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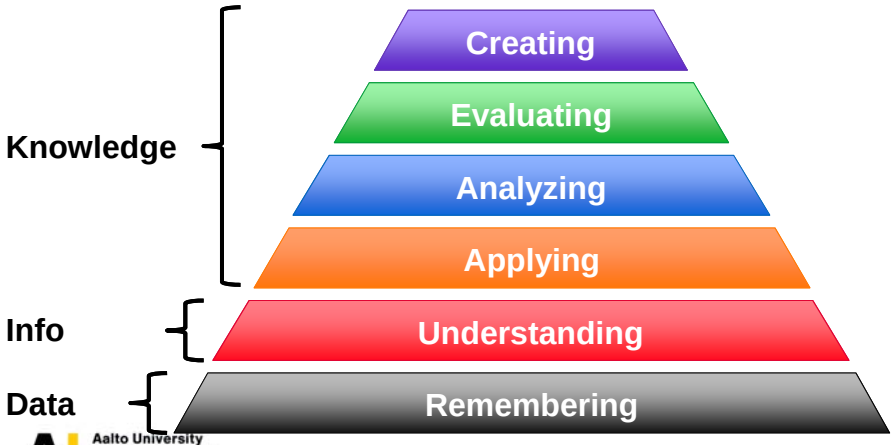
Education
Bloom's Taxonomy (Cognition)



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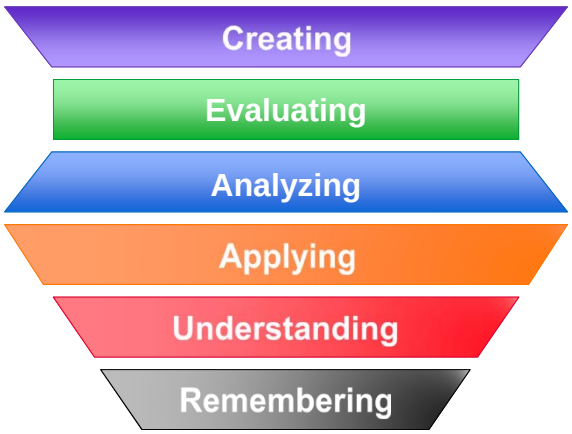
Education Reloaded
Bloom's Taxonomy (Cognition)



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Redistribution of Priorities

- Given the change in cognition and working skill demands
  - **Learning objectives need to change**
  - **All domains** in Blooms model are **affected**
- **Cognitive Domain**
  - Application & analysis more important than remembering
- **Affective Domain**
  - Empathy & sensitivity crucial when working inter-culturally
- **Psychomotor domain**
  - Focus on learning to use IT and to improve verbal communication

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Conclusions
New Approaches to Education

- **Collaborative cross-cultural project work**
  - Learning across continents, cultures, languages, time-zones
- **Situation-based understanding & analysis of information**
  - Disassembling of problems, no initial solutions
- **Visualization & presentation of data**
  - Ability to make creative and interactive presentations of complex data to increase understanding, e.g. Gapminder

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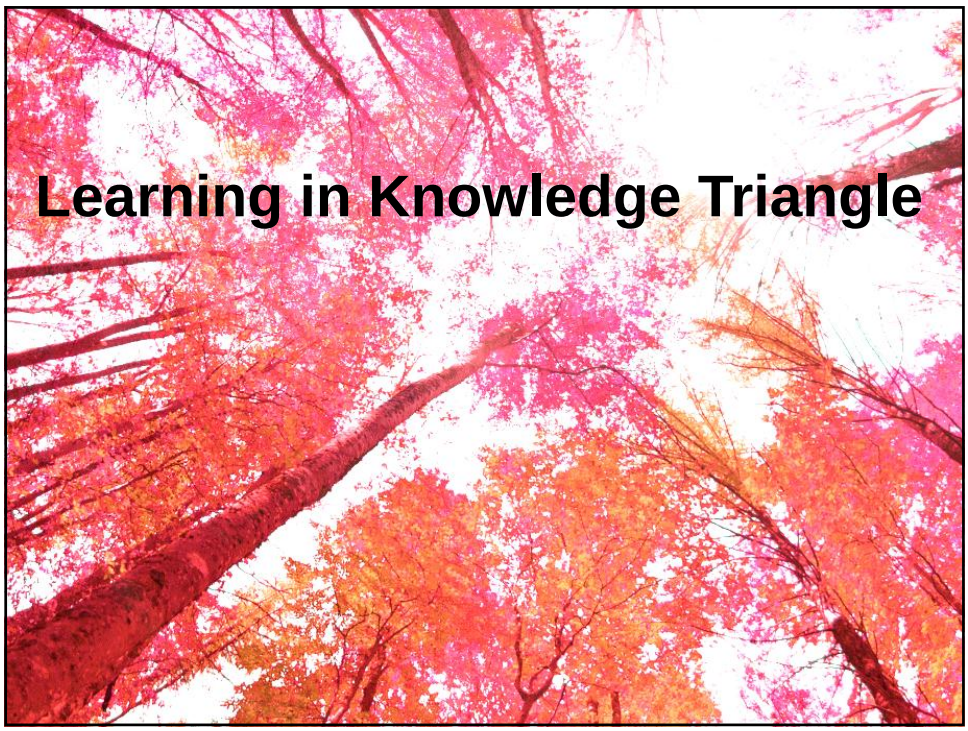
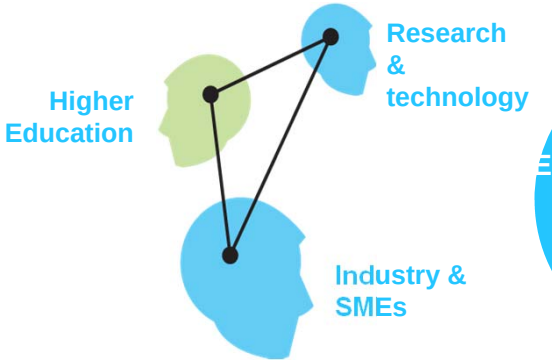

Learning in Knowledge Triangle


eit
European Institute of
Innovation & Technology
Powering Innovation in Europe:
the European Institute of
Innovation and Technology
(EIT)

THE CORE OF INNOVATION IS THE KNOWLEDGE TRIANGLE



ENTREPRENEURIALLY DRIVEN INNOVATION

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THE KNOWLEDGE & INNOVATION COMMUNITIES (KICs)

eit European Institute of Innovation & Technology

THE KIC MODEL (1/2)

- **High degree of integration**: each KIC is an independent legal entity
- **Long-term strategic approach**: each KIC is set up for a minimum of 7 years to eventually become self sustainable.
- **Sufficient autonomy and flexibility:** to determine organisational structure and activities governed by a Board of KIC partner organisations
- **Effective governance**: run by a CEO and a lean management team at central and co-location level.

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THE KIC MODEL

- **Smart funding & high degree of commitment of partners**: EIT funding to KICs is max. 25% of their total budget over time with 75% to be attracted from other sources, both public and private.
- **The co-location model**: each KIC consists of 5-6 world class innovation hotspots building and leveraging on existing European capacities.
- **Results/High-Impact-oriented activities**: KICs implement a Business Plan with measurable deliverables, results and impact
- **Culture:** KICs are shaped by strong entrepreneurial mindsets and cultures

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THE FIRST 3 KICs

Designated in December 2009 by the EIT Governing Board

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EIT ICT Labs

• **Mission:** EIT ICT Labs intends to turn Europe into the global leader in ICT innovation by establishing a new type of partnership between leading companies, research centres and universities in Europe.

• **Thematic Focus Area:** smart spaces, smart energy systems, health and wellbeing, digital cities of the future, future media and content delivery and intelligent mobility and transportation systems

• **Governance:** CEO – Willem Jonker , Chairman – Henning Kagermann

• **Partners** inc. Alcatel Lucent, Fraunhofer, KTH, Nokia, Aalto University, Ericsson, INRIA, Philips, Orange, SAP, Siemens, TRENTO Rise, Universite Paris Sud, Telecom Italia, VTT,...

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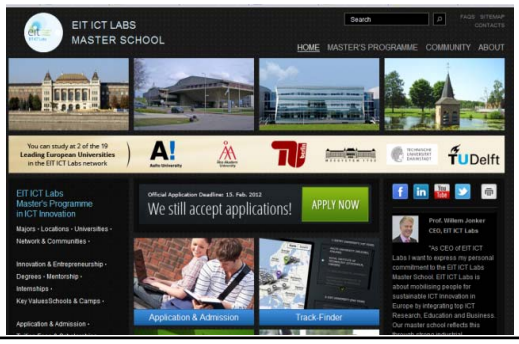
EIT ICT Labs

- EIT ICT Labs breeds **entrepreneurial ICT top talent** via the transformation of higher education to promote **creativity and entrepreneurial spirit**.
- This community speeds up ICT innovation by bringing people together from different countries, disciplines and organizations.
- EIT ICT Labs generates **world-class ICT business** via broader and faster **industrialization of research results**.



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KICs' Achievements

From 2010 to end of 2012 *(foreseen)*

- No of Education Programmes (MSc / PhD) = 20
- No of Students = 1070
- No of Innovation Projects = 100
- No of Start-ups = 27
- No of Products/Services = 100
- No of Patents = 35
- No of Publications = 86

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Conclusions
Bit Bang
Education Reloaded
EIT