educating game changers

rethinking learning, teaching and education for innovations

new learning environments

ELIG Annual Conference in London
19.9.2014
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20 000 students
350 -> 400 professors
5000 staff total

Where Science and Art meet Technology and Business

• Spear head of Finnish university reform 2010->
  • More freedom to implement own strategy and organization
  • New personnel structure (tenure track) and freedom to use new resources
  • More strongly part of national innovation system, drivers for new innovations

• New unique combination: art and design + business + technology

• Main campus in Otaniemi: own metro station, new buildings and renovation of old ones, Bachelor Degree Center, Learning Center,... pilots of collaboration platforms

• Foundation based university, significant increase in resources
The future we want build **with** our students?
The future scenarios our curricula are based on

What we are good **at**?
What we are good **for**?
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.

ACCORDING TO THE U.N. BY THE YEAR 2100 GLOBAL POPULATION WILL PEAK AT 10.6 BILLION

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

Sources: 2011 Population Reference Bureau
By: Kevin A. Kepple, Jerry Moses, Paul

USA Today (30.10.2011)
Globalisation - (digital)technology shift - robots - middle-class shift

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

Shares of Global Middle Class Consumption, 2000-2050

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Peetu18
Martti 75
"Changing customer attitudes, behaviour and demographics are reinforcing the deepening impact"

(PwC 2014)
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

**extreme longevity**
Increasing global lifespans change the nature of careers and learning

**computational world**
Massive increase in sensors and processing power make the world a programmable system

**rise of smart machines and systems**
Workplace robotics nudge human workers out of rote, repetitive tasks

**new media ecology**
New communication tools require new media literacies beyond text

**globally-connected world**
Increased global interconnectivity puts diversity and adaptability at the center of organizational operations

**superstructured organizations**
Social technologies drive new forms of production and value creation

**Sense-Making**

**Design Mindset**

**Virtual Collaboration**

**Computational Thinking**

**Cognitive Load Management**

**Cross Cultural Competency**

**New Media Literacy**

**Social Intelligence**

© 2011 Institute for the Future for University of Phoenix Research Institute

http://www.iftt.org/futureworkskills2020
Educational development

Disciplinary initiation
(knowledge field as given)

Disciplinary wonder
(knowledge as uncertain and open to change)

No risk

Generic skills
(fixed ontologies for unknown world)

Human being as such
(open ontologies for an unknown world)

High risk

Educational transformation

Roland Barnett 2004: Learning for an unknown future
Educating Game-changers 2.0

- Increasingly project based courses with real-life cases from the industry
- Students as co-creators leads to new openings, increased motivation and self confidence

Crossing borders

- Risk taking and diversity as resource
- Multidisciplinary Master programs (IDBM, CS), Aalto mobility courses between disciplines, Factories, AALTOonaut program
- International links and collaboration

Alignment of studies and gaining work experience

- Comprehensive set of transferable skills for working life
- Integrating summer internships and external projects to the studies
- Systematic coordination of thesis projects

Entrepreneurship

- Startup Sauna, Aalto Ventures Program, Aalto Centre for Entrepreneurship in collaboration with Stanford University
  - Entrepreneurial culture, mindset and skills
  - Business acceleration
  - Ecosystem creation
TOOLS OF DESIGN THINKING (Tim Brown: Change by Design)

- be inspired by people and diversity
- open your eyes, observe the ordinary (obvious)
- learn & think with hands, use prototyping, experiment
- document the process as it unfolds (and results)
- create stories to share ideas, make it visual
  = communicate complex ideas with meaningful and inspiring simplicity
- collaborate: join forces with people from other disciplines, build on the ideas of others
  -> deepen knowledge & widen the impact
Design Factory

‘Starter Kit’

Our philosophy of Creation:

- 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!!!
Aalto multidisciplinary courses
- Crystal Flowers in the Halls of Mirrors: Mathematics Meets Art and Architecture

http://www.youtube.com/watch?v=XiFyBI6Pn8I
http://www.youtube.com/watch?v=EzhloVI3w04
http://www.youtube.com/watch?v=fwVwZnYTWNI

Photos: Jesper Jokilehto ©, 2013

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Design Factory concept
- symbiosis of state-of-the-art conceptual thinking and cross-disciplinary hands-on-doing in collaborative environment
Aalto-Tongji Design Factory
Co-working and co-creation space (started 2013) linked right to the Aalto University Design Factory and the Startup Sauna.

Together these three spaces will act as a physical and social Knowledge Triangle test-bed for the Otaniemi campus and for the whole T3 area (Espoo city).
Open Innovation House (OIH)
- AppCampus spaces
Mutual campus - platforms for collaboration
Campus 2015 - open international architectural design competition

"Väre“ designed by Verstas Architects

“Väre” is the symbol of a future-oriented multidisciplinary university in the heart of the Otaniemi campus area.
The main entrance, lounge and cafe, exhibition gallery and stage breathe life to the foyer of the ARS building.

"Väre" designed by Verstas Architects (Verstas Arkitehdit Oy)
Several buildings and interiors designed by **Alvar Aalto** (former TKK campus)

-> challenges / options for rebuilding and renovating the campus
Dipoli designed by Reima and Raili Pietilä (1961 / 1965)
Students’ active role = co-creation

Students key actors in reforms - trust, support, freedom and responsibility

- Startup Sauna - http://startupsauna.com
- Slush - http://slush.fi
- Aalto on Tracks - http://aaltoontracks.com
- Aalto on Waves - http://www.aaltoonwaves.com
- Aalto in Africa - http://aaltoinafrica.com
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Creating new learning hubs by & for students

Sundeck, Greenhouse, Living room,...

17 hubs so far

-> new hubs in progress
Learning hubs: **Living room**

Learning hubs: **Rooftop**, 2014 (BIZ, Töölö)

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

kuvat: Heikki Juutilainen

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Learning Hub Greenhouse (SCI)
Development Process

Find Space
Recruit Student Team
Involve Locals in Planning
Design

Communicate the Process
Involve Locals in Construction
Celebrate Opening
Observe, Learn and Improve

Involving the final users at all stages is the key element to success. Development process is never finished.

Valeria Gryada, Designer, Aalto University
19 February 2014
Aalto strategy = **pioneering education** = inspiring digital shift in education

- teaching based on **latest knowledge** and **learning centred methods** - passion, care, commitment
- leading university to develop and implement **innovative use of ICT** to enhance learning
Students
• digital/ game natives

Digital Culture

Informal learning

Digital Culture & building using social media
• play, joy, passion, masup,...

HE Institution

Professional identity

Educators’ new role:
sense-making and coaching

Learning Culture
and Academic Practices

Aims of curricula
knowledge, skills, abilities, understanding,...
e.g. social skills, communication skills, ability to apply knowledge

Collaborative knowledge sharing
& building using social media
knowledge, skills, abilities, understanding,...
e.g. social skills, communication skills, ability to apply knowledge

Reform teaching-/learning methods
• play, joy, creativity, innovative mode, visual thinking, digital media literacy,...
Aalto Digital Agenda for Learning and Teaching (draft)

Key principles

- **blended learning methods in all courses - digital first** (OCW, MOOCs, SPOCs,... integrated with f2f sessions)
- **functional learning environments, platforms and tools** as well pedagogical and technical support for courses
- **portals and platforms for sharing** good and inspiring learning and teaching practices & models make it visible = make it shareable
- **BYOD** (Bring You Own Devices): laptops or tablets basic tools for students & academic staff
- **open WiFi** everywhere on campus(es)
- **open access** to content and data – open sharing
- **clear and transparent guidelines and rules** for resource allocation and ICT policy - e.g. cloud services, security
Peer instruction in lecture-based physics class (Jouko Lahtinen, SCI)

- more interaction, discussion and spontaneous questions in mass lectures
- students active role: peer teaching/learning, immediate feedback to support learning
- better motivation, lectures with more interest, better results in exams (when involved in lectures)
ADDLab - over 100 h open lectures on web
mapping new landscape of digital design

http://addlab.aalto.fi

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Lablife 3D laboratory in Second Life in Aalto Archipelago
- new concept for biotechnology and chemistry education

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

Decarboxylation

RNA -analysis

Kangasniemi & Nordström, December 2012
crossing borders

with

enriching dialog
& passion based
learning + pedagogy

for better future