

Quality in Higher Education: A (very) personal view

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Mission of a University

« The university is an institution that exists to advance culture, both by acquiring more knowledge and by disseminating received knowledge in ways that inspire young people to use it both creatively and constructively »

Donald Kennedy
« Academic duty »

Challenges faced by Universities in the 21st Century

- Current situation: rising of tuition fees*, changes in demand, disruptive technologies
- Tomorrow: “within 15 years more than half of the universities will be bankrupt”
- Life-long learning: a need to re-educate the work force



* US students debt: 1.2 trillion US\$

Challenges faced by Universities in the 21st Century

Evolution of the type of higher education institutions

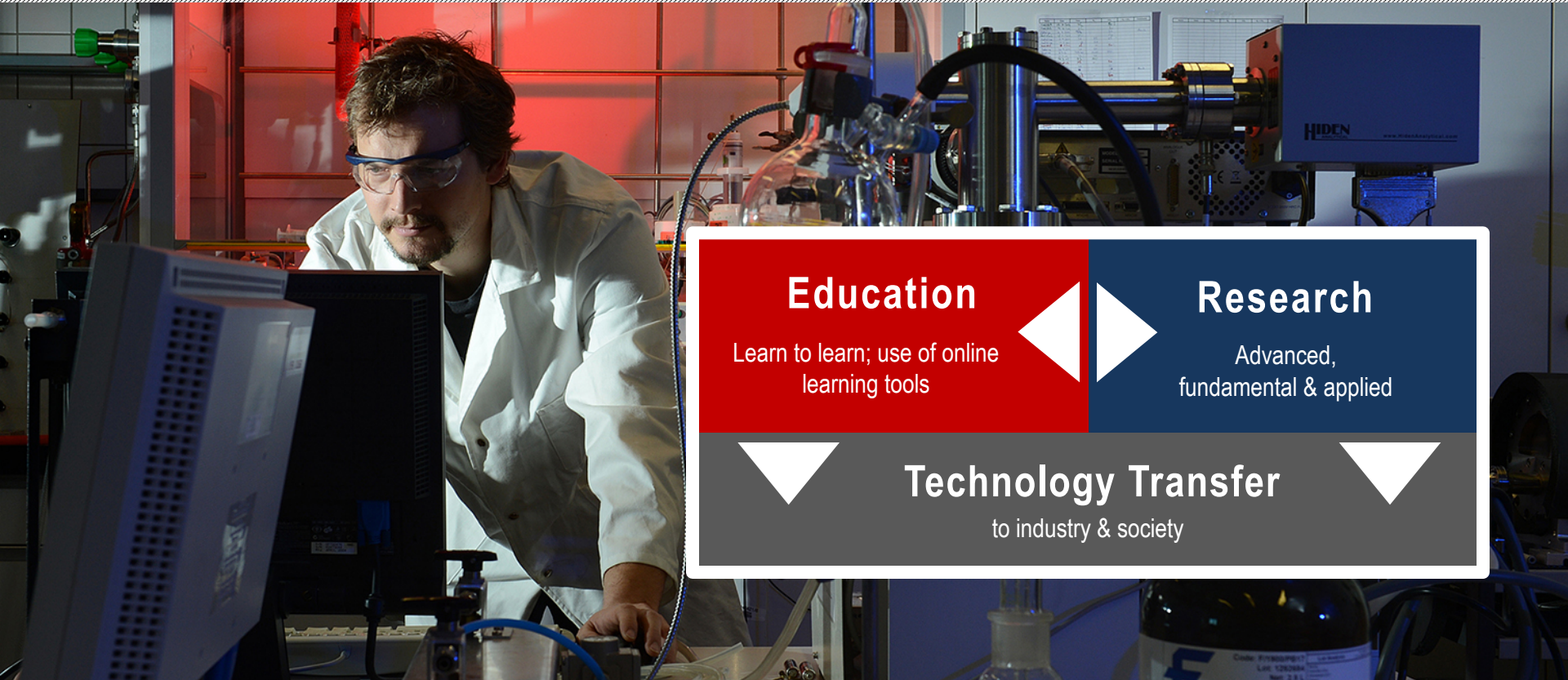
- Increased number of teaching colleges blending on-line and residential experience
- Development of “on-line” based life long learning institutions (role of GAFAs?)
- Fewer but bigger world class research Universities

Challenges faced by Universities in the 21st century

Evolving context

- ▣▣▣▣ ➔ Internationalization of higher education
- ▣▣▣▣ ➔ Competition for top (and paying...) students
- ▣▣▣▣ ➔ Impact of University rankings (THE, QS, ARWE etc.)
- ▣▣▣▣ ➔ Development of powerful e-learning tools
- ▣▣▣▣ ➔ Generalization of Quality Assurance
- ▣▣▣▣ ➔ Issue of financial sustainability

Missions



Education

Learn to learn; use of online learning tools

Research

Advanced, fundamental & applied

Technology Transfer

to industry & society

Quality in Higher Education

Key ingredients

- ▣▣▣▣▶ Top quality students and faculty
- ▣▣▣▣▶ Appropriate autonomy
- ▣▣▣▣▶ Academic freedom
- ▣▣▣▣▶ Innovative environment
- ▣▣▣▣▶ Adequate level of funding
- ▣▣▣▣▶ High quality infrastructure and facilities
- ▣▣▣▣▶ Appropriate leadership and governance

The digital revolution

A challenge for education and research

→ Education

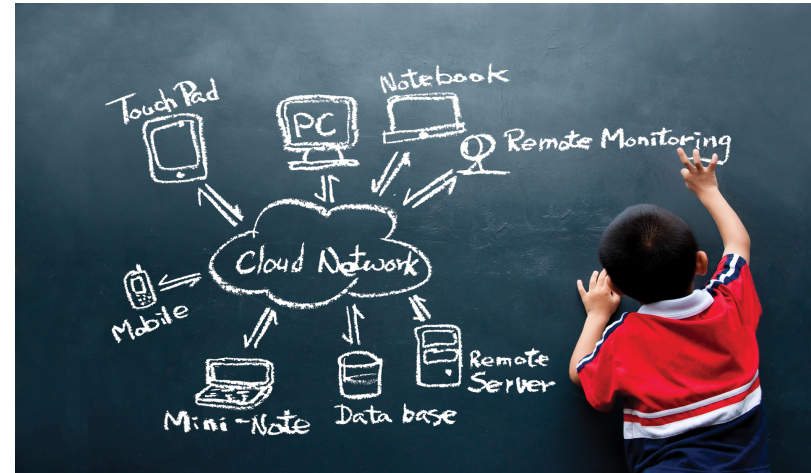
MOOC's – Massive Open Online Courses

→ Research

Development of Open Access

Collaborative research

Simulation-based research



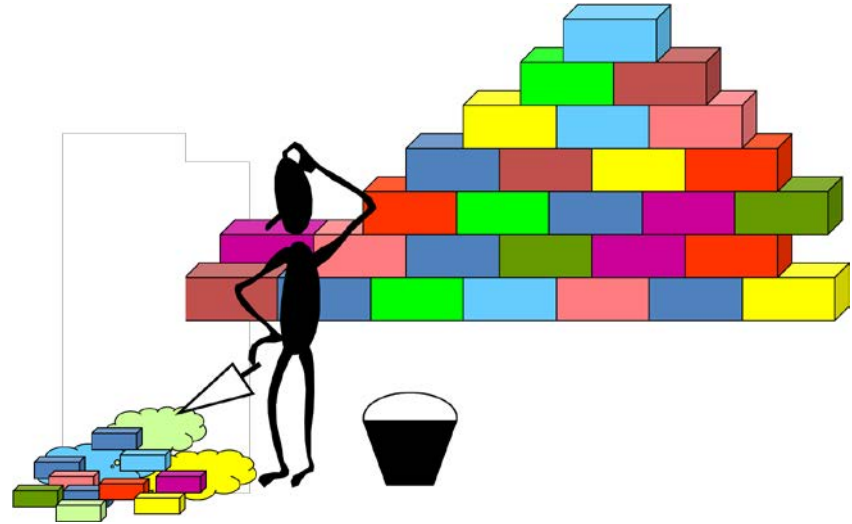
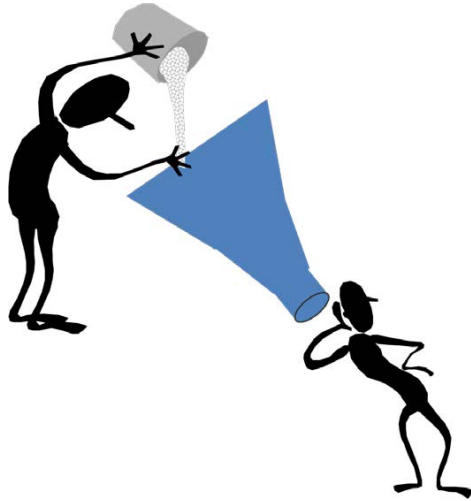
Students

Attract (and retain) the best students

- Teach in English at the Master level (at least for technical Universities)
- Offer scholarships
- Guaranty a good student/faculty ratio
- Promote mobility (Erasmus, etc.)
- Create an attractive and lively campus
- Develop the branding and corporate culture of the University

Higher Education is changing !

From transmission ...



... to accumulation and construction of knowledge

Adapt our education to the digital revolution

Location



Format



Age

18-25 year old



8-88 year old?

Adapt our education to the digital revolution

How to train professionals ?

Reputation
of the university



“Uberification” of Universities ?

- Recognition without certificate? Kaggle points
- Companies like Google fight for getting the best Kagglers

Hiring? We have 325,767.00 data scientists.
LEVEL TO PROVEN EXPERTS, FIND YOUR NEXT DATA SCIENTIST HERE.

Post on the Jobs Board »

Hiring?
Access 1,467,973 data scientists.

Kaggle is the world's largest community of data scientists, statisticians, and machine learning engineers. Kagglers demonstrate the skills to solve the toughest problems across many industries.

+ Create a job listing

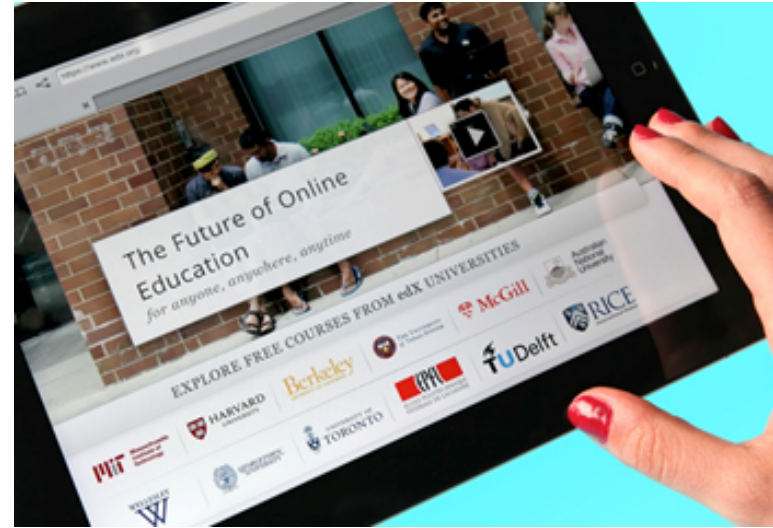
EPFL MOOCS USERS

A world map with a dark blue background and a light blue grid. The map is covered with numerous small, glowing orange dots representing EPFL MOOC users. The dots are most densely packed in North America, Europe, and South America, with a significant concentration in the United States and Western Europe. There are also scattered dots across Africa, Asia, and Australia.

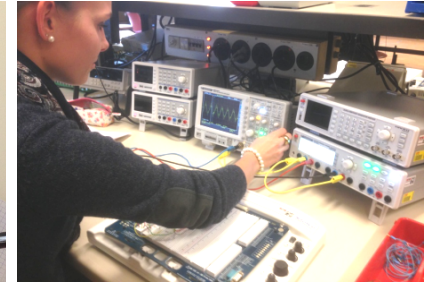
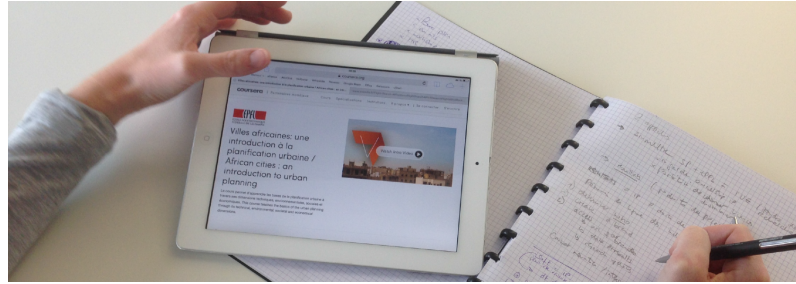
Total : 2'003'378 students registred on EPFL MOOCs

MOOCs – the EPFL experience

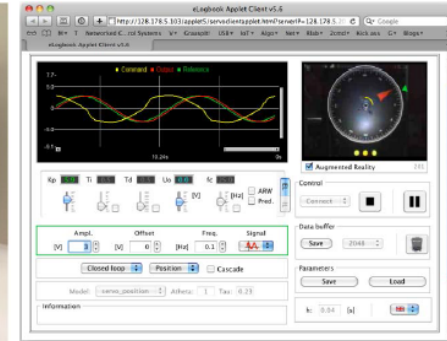
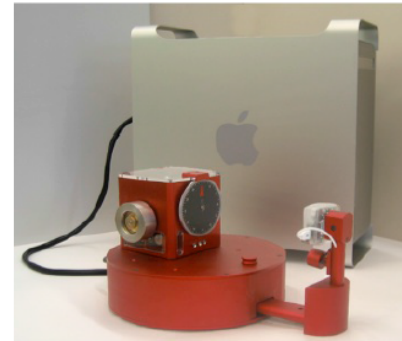
- 81 MOOCs EPFL on line; 33 in production
- September 2012 – December 2016 :
2'003'378 participants from 186 countries
- 66% are not students (continuing education), of which 90% are employees
- 34% of the EPFL MOOCs are taken in French
66% of the EPFL MOOCs are taken in English
- > 100'000 users have succeeded and received a certificate



Education 2.0



- Reduce the number of ex-cathedra lectures
- Flip the class and use of the MOOCs
- Problem solving approach
- Foster team work and projects



Distance practical work for students

Continuous education

Concept of the Extension school

- Develop new forms of life long learning
(blend of online/residential experience)
- COS (Certification of Open Studies), with no prerequisites
- Establish a “Nanodegree” offer using on-line tools
- Development of vouchers for industry



EPFL Extension School



- Online courses open for everyone
- Fees: 300-490 CHF/month
- Coaching and evaluation by experts
- EPFL Certificate of Open Studies
- Machine learning, artificial intelligence, data science, web development, mobile applications, etc.



OUR MISSION IS SIMPLE

Enabling everyone to learn the skills necessary to benefit from the opportunities of the digital age

Campus: need for socialization



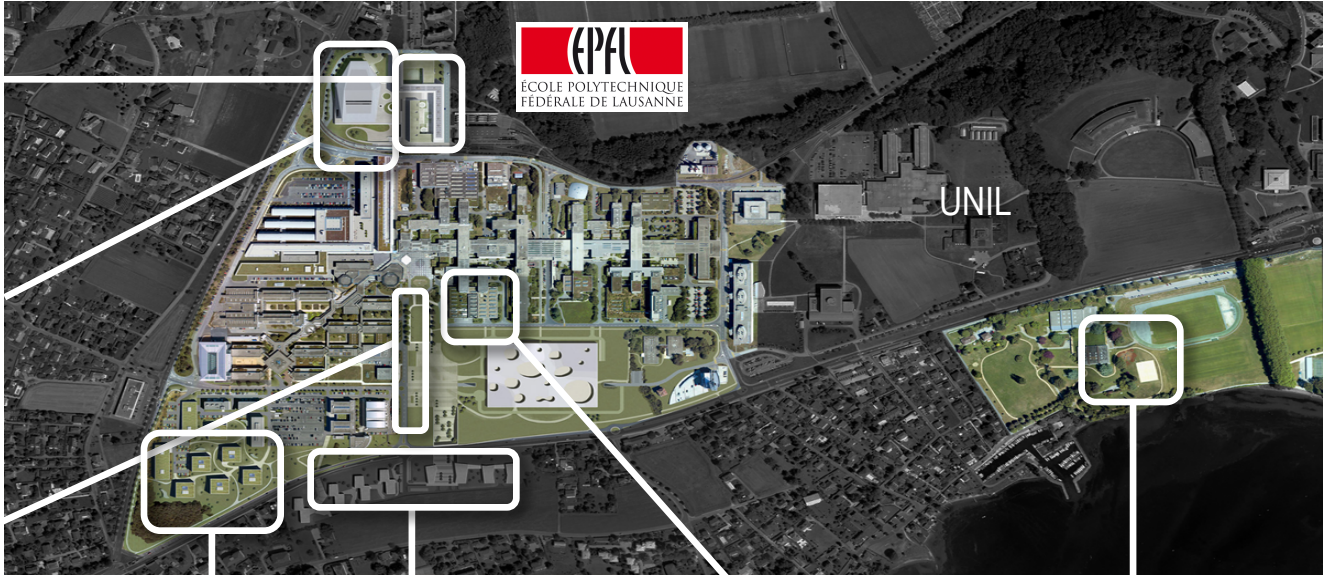
Student housing



Swiss Tech Convention Center



Under One Roof



EPFL Innovation Park



Les Estudiantines & Starling Hotel

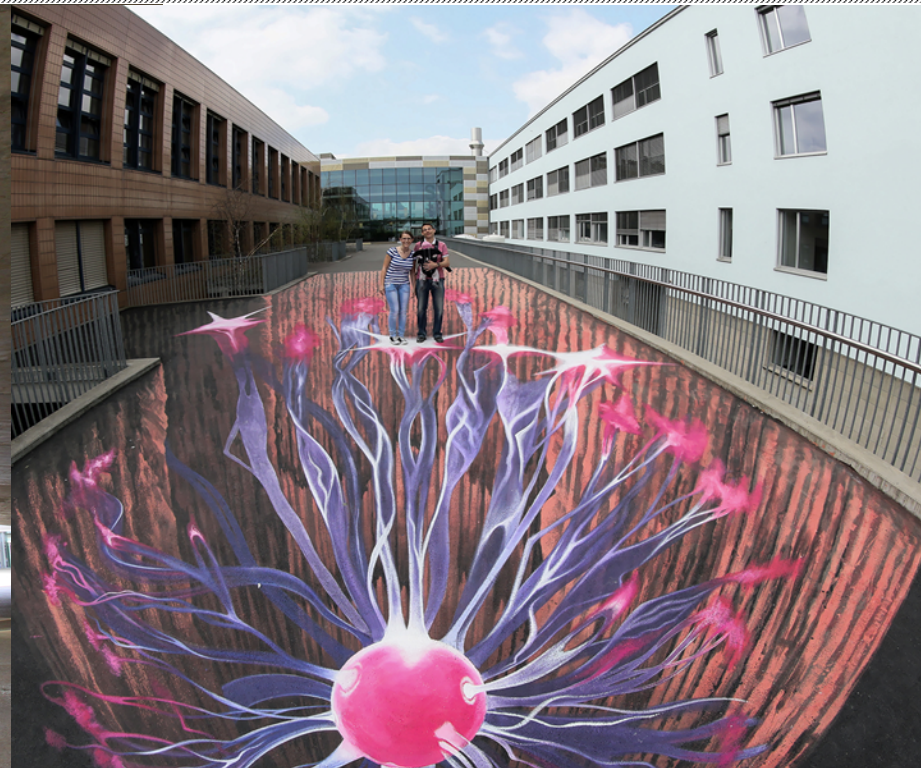


Mechanical Engineering



Extension sports center

Create an inspiring campus



School projects dedicated to students

Alinghi



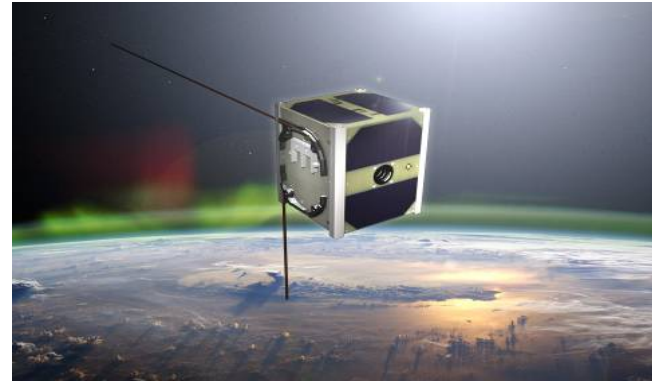
Solar Impulse



Hydroptère



Swiss Cube



Faculty

Attract (and retain) the best Faculty

- Recruit on a world wide level
- Develop a tenure track system
- Competitive funding (start-up costs + running budget)
- Modern infrastructure
- Competitive salaries

Faculty recruitment philosophy

“Elite revolutionary science should (...) be a place that welcomes brilliant, impulsive, inspired, antisocial oddballs – so long as they are also dedicated truth-seekers”

Bruce G. Charlton, Medical Hypotheses 72, 2009

Innovation culture

A question of emotion



Rolex Learning Center@epfl.ch

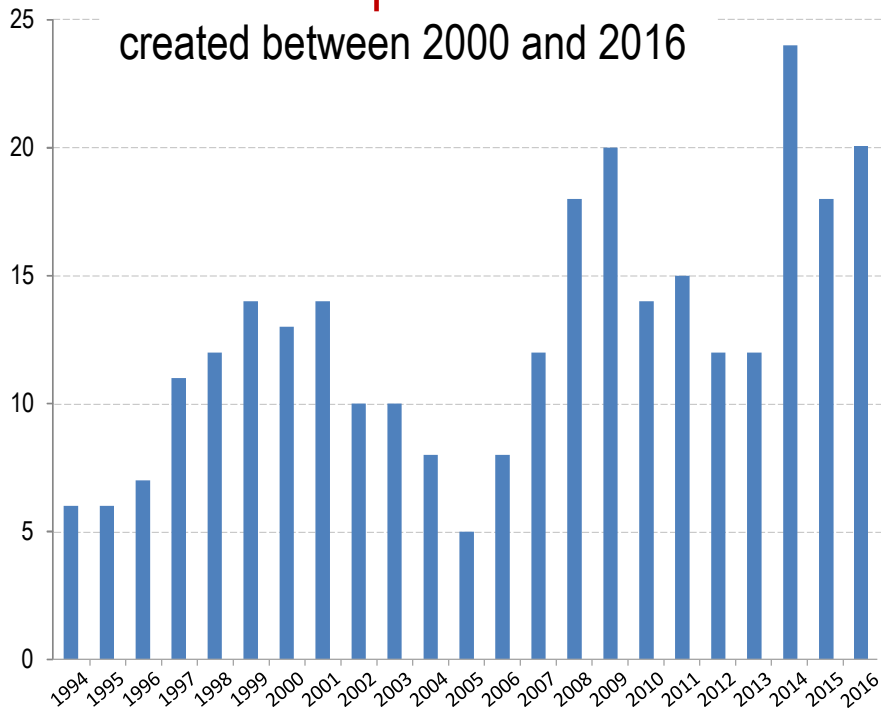
Innovative environment



Development of EPFL start-up

233 start-up

created between 2000 and 2016



EPFL Innovation Park

- 55'000 m² of labs and space offices
- More than 120 start-ups
- 20 large companies
- Creation of 2'000 high added value jobs

INFORMATION
TECHNOLOGY
FINANCE
COMPUTING



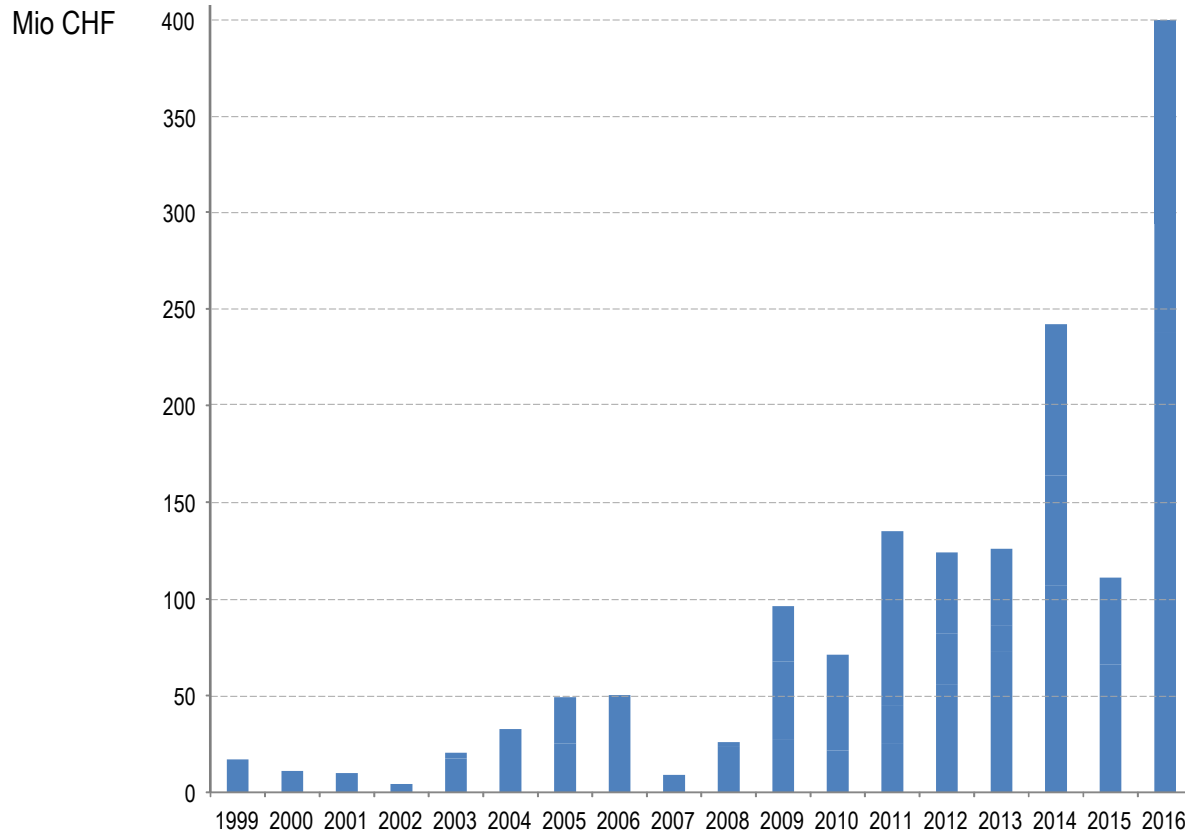
HEALTH
NUTRITION



ENGINEERING, TRANSPORT,
MATERIALS



VC financing of start-up @ EPFL Innovation Park



Leadership

- « An academic Institution is not like an orchestra with a president as conductor. MIT is more like a jam session among a lot of talented musicians who listen to each other and get into the flow. The president, provost, deans and other administrators strive to hire the right « musicians », draw the themes from the evolving music, and keep the beat going. »
- « An academic Institution evolves 50% by planning and 50% by serendipity. »

Charles Vest, past president MIT

Quality in Higher Education

Autonomy

Accountability



Be pragmatic and avoid bureaucracy !

Quality in Higher Education

Quality assurance ...

- has not to be mixed with quality control
- is not just bean counting
- is not just a question of defining processes
- should not be reduced to a “tick the box” approach
- should not be coupled with reporting and bureaucracy



Be different

Conformity ...



vs. specificity, originality and “génie propre”

EPFL 2017 ranking



QS Ranking : 12



Times Higher Education : 38



Shanghai Ranking : 76



CWTS Leiden : 18 *



Nature Index: 31



US News & World Report: 36

THE under 50: 1st



EPFL: 2015, 2016 & 2017
best young worldwide
University

* Impact indicator PP(10%): proportion of a university's publications that, compared with other publications in the same field and in the same year, belong to the top 10% most frequently cited

Challenges faces by European Universities

The imperative necessity to evolve

“ Change is unavoidable for Europe’s academics. The world is indifferent to tradition and past reputations, unforgiving of frailty and ignorant of custom or practice. Success will go to those individuals and countries which are swift to adapt, slow to complain, and open to change ”

Andreas Schleicher, head of the OECD education directorate

Thank you for your attention

