

# Doctoral Ed @EPFL: Future Developments

Pierre  
Vandergheynst  
VP Education

## And a bit of statistics

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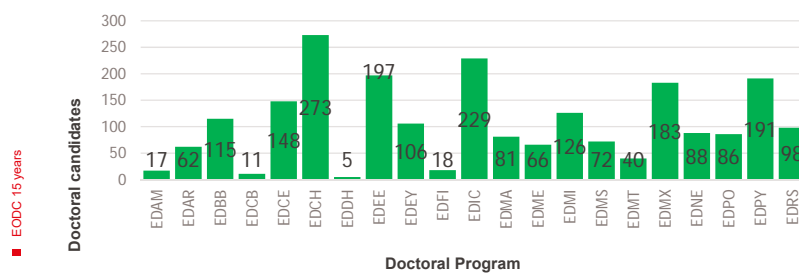
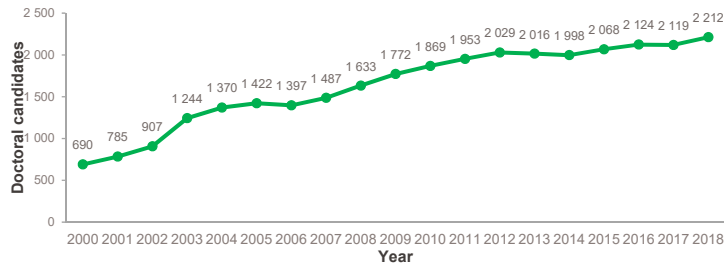
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End-of-Thesis survey (all PhDs who succeeded in 2017/18):

**High** degree of **satisfaction** (but room for improvement)



# No EPFL without EDOC



## Doctoral Programs

|  |      |
|--|------|
| Advanced Manufacturing                           | EDAM |
| Architecture and Sciences of the City            | EDAR |
| Biotechnology and Bioengineering                 | EDBB |
| Computational and Quantitative Biology           | EDCB |
| Civil and Environmental Engineering              | EDCE |
| Chemistry and Chemical Engineering               | EDCH |
| Digital Humanities                               | EDDH |
| Electrical Engineering                           | EDEE |
| Energy   | EDEY |
| Finance  | EDFI |
| Computer, Communication and Information Sciences | EDIC |
| Mathematics                                      | EDMA |
| Mechanics  | EDME |
| Microsystems and Microelectronics                | EDMI |
| Management of Technology                         | EDMT |
| Materials Science and Technology                 | EDMX |
| Molecular Life Science                           | EDMS |
| Neuroscience                                     | EDNE |
| Photonics  | EDPO |
| Physics  | EDPY |
| Robotics, Control, Intelligent Systems           | EDRS |

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## What is the PhD?

EDOC 15 years



- Training at cutting-edge research
- Learning to face an unsolved problem
  - Resilience!
  - Strategy!
  - Resourcefulness!
- A lot of hard work
  - Hours can't be estimated
  - Deal with frustration of research
- A diploma and therefore education
  - Some freedom implicit
  - Always question the value of the diploma
  - Learning environment

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"Behind one door is tenure - behind the other is flipping burgers at McDonald's."

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■ EODC 15 years

## CHALLENGE ONE

The Job Market for PhD Graduates

# ARE WE TRAINING TOO MANY SCIENTISTS?



**SUSTAINABLE DEVELOPMENT GOALS**  
17 GOALS TO TRANSFORM OUR WORLD



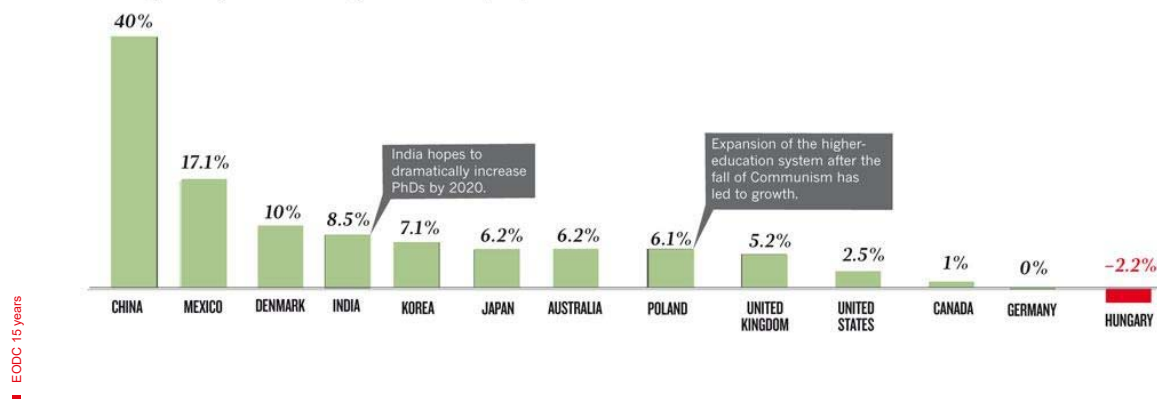
## Disposable lab workforce ?

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### The rise of doctorates

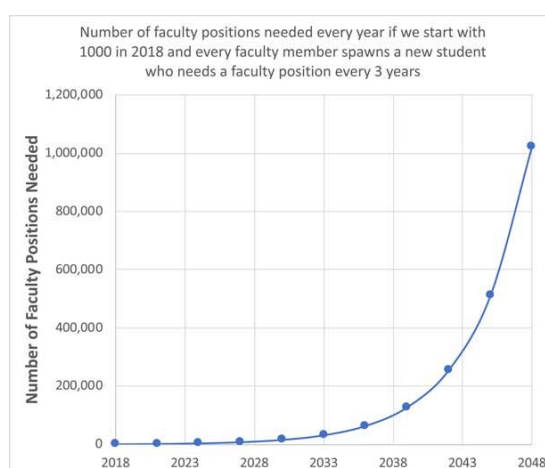
Major expansion of higher education has boosted PhD output in many countries, shown here as average annual growth of doctoral degrees across all disciplines, 1998–2006.



## The (idealized) Job Market

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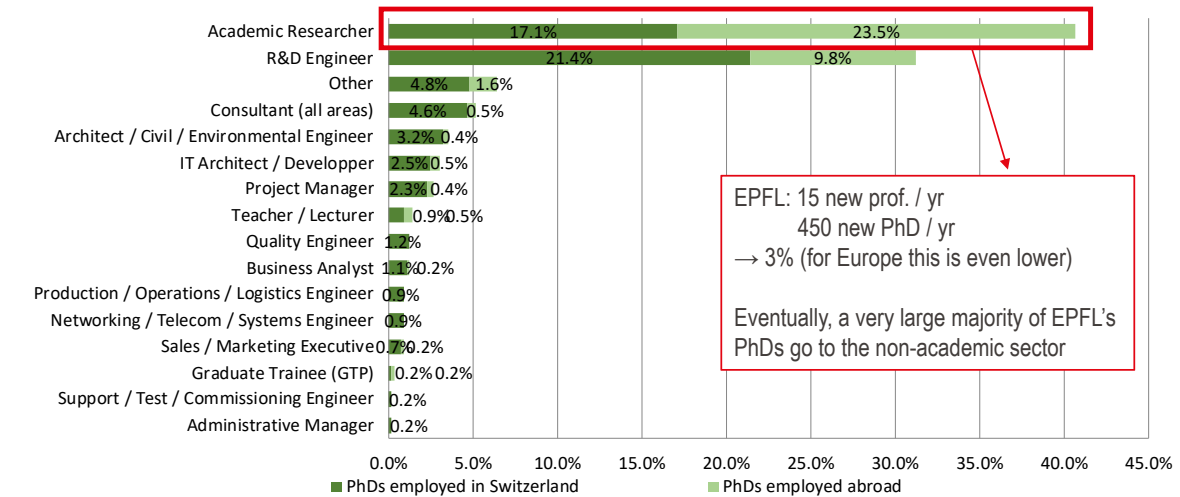
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## Challenge: what job?

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EODC 1

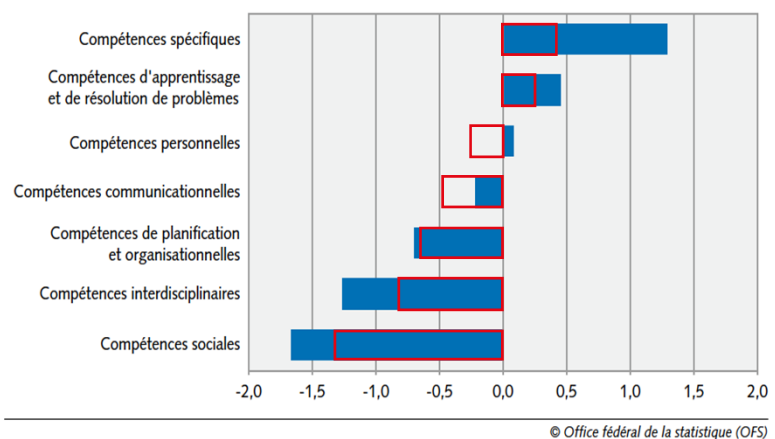
## Challenge: what job?

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Federal statistics office (2010)

PhDs feel they lack some communication, planning, organization, interdisciplinary, and social skills



EODC 15 years

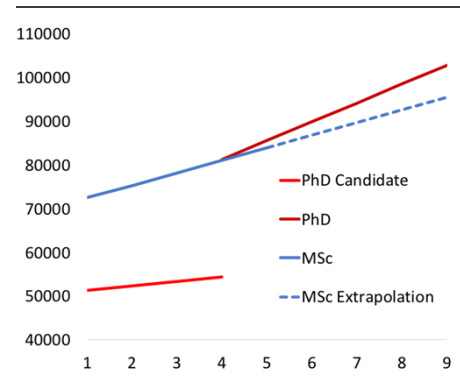
## Challenge: what job?

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- After EPFL PhD studies, the starting salary is about the same as that of an MSc with 4 year work experience (doing a **PhD** is valued as much as **work experience**)
- **PhDs** increase **slightly faster**
- During the PhD studies they “lose” 100'000 CHF (which takes many years to recover)

But, they have a **PhD!**



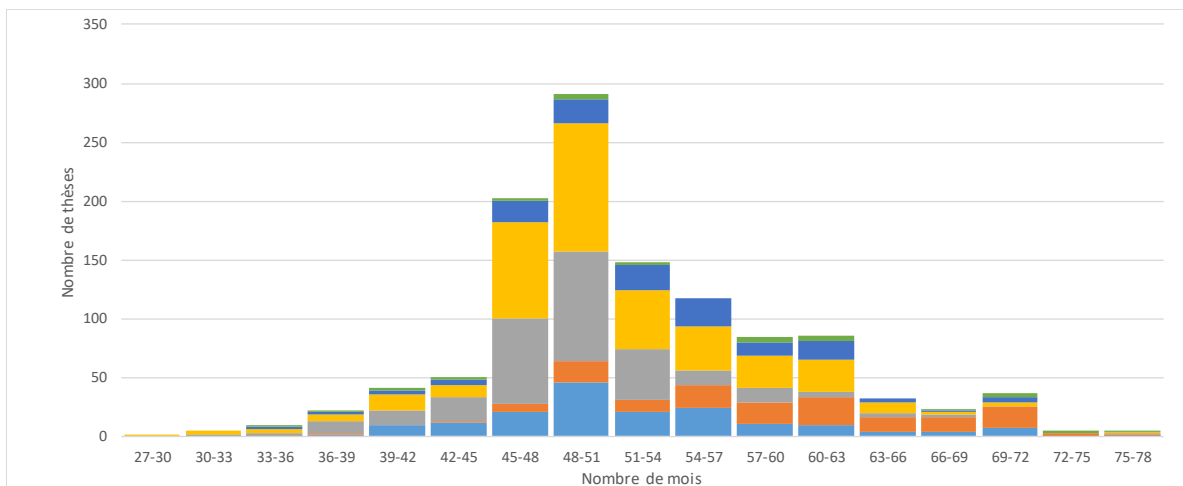
Rem: research from Warwick U shows exactly same trend at EU level

■ EODC 15 years

## Challenge: what job?

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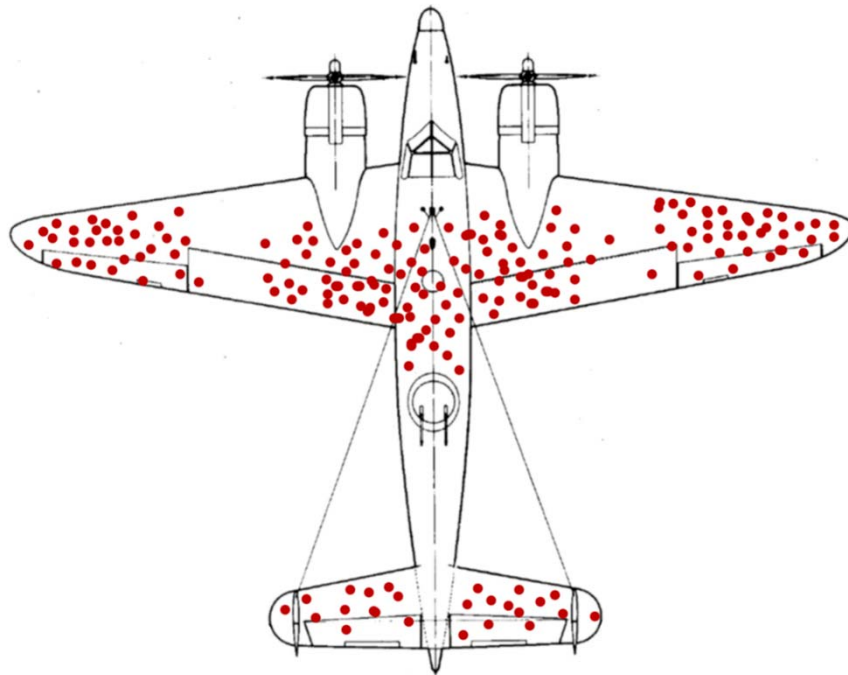
■ EODC 15 years

- Pilot projects like EPFLinnovators
  - Test different requirements leading to graduate profiles sought by economy and society
- Revise transversal skills policy of EDOC
- Keep adding offer and structure to transversal skills
- Aim at keeping duration of PhD “at bay”



## CHALLENGE TWO

A Mental Health Crisis?



## Mental Health Crisis?

The study states that 32 % of PhD students are at risk of having or developing a common psychiatric disorder, especially depression. This number was significantly higher than those for the comparison groups.

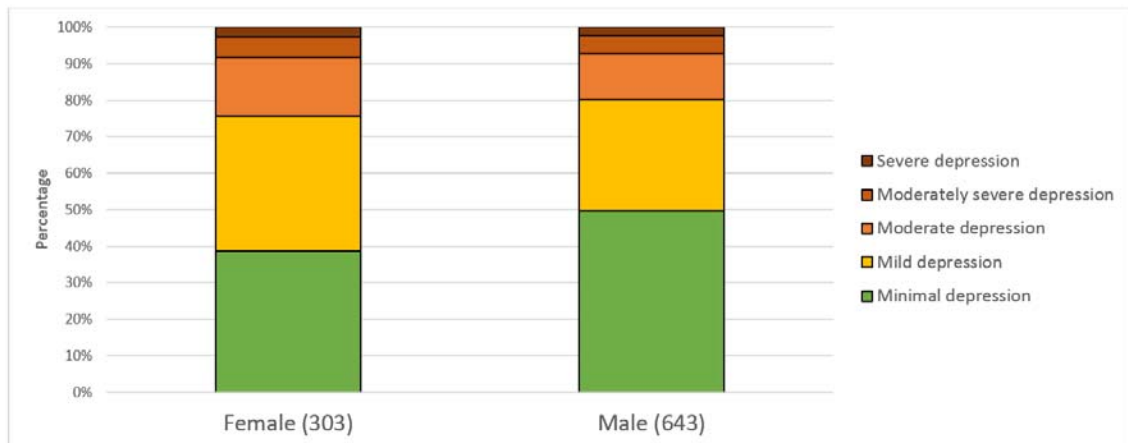
These disorders can be linked to the work-family interface, job demands and job control, the supervisor's leadership style, team decision-making culture, and perceptions of a career outside of academia.

Other factors also contribute, such as increased workloads intensification and the pace of change

Work organization and mental health problems in PhD student  
<https://doi.org/10.1016/j.respol.2017.02.00>



Chart 32: Levels of depression reported, by gender



■ EODC 15 years



■ EODC 15 years

## The way ahead

Some directions to make it all better

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## We have no “magic wand” but ...

- PhD experience revisited
  - Learn to build and use a network
  - A one-stop shop for problems
  - Develop a culture of fellowships
- Develop skills for all and “brand” PhD for its uniqueness
  - Career development should be a growing concern
  - Transversal skills should be encouraged. How?
  - Academia should highlight PhD for its unique value
- Leadership program
  - Many don’t go to academia? Great!
  - Encourage career paths that serve society