The first 1 semester(s)' experiences from KTH

How to design introductory periods to ensure that students will succeed in their studies

German Rectors Conference Berlin

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Is the composition of the student body more diverse?

- In Sweden, 40% of twenty year olds should continue to higher education due to government decision (2011)
- In Sweden, 35% of the students in higher education have at least one parent with a university degree, at KTH 50% of the students have at least one parent with a university degree (2011)
- In Sweden, 17% of the students in higher education have an international background (were born or both parents were born in another country), at KTH 28% have an international background (2011)

Reference: Swedish National Agency for Higher Education

How should engineering departments reflect diversity among students?

- Design the introductory period by implementing an Academic Introduction Course during the first semesters
- The Academic Introduction should introduce the students to academic studies as a whole since it might be a completely new and unknown field to them and explain the meaning of specific concepts, how it works and who is who at the University
- Let this Academic Introduction continue at least during the first year, or more, since the students meet new situations continuously
- Encourage students to feel that they belong at the University

Examples: ATTRACT WP8 case study ”KTH Programme Integrating Courses”. Introduction Course at Uppsala University.

Reference: Yorke, M. & Longden, B. (2004). Retention and Student Success in Higher Education. Maidenhead: Open University Press.

How can introductory periods be successfully designed?

- High expectations (let students know you expect them to be successful)
- Timely support (aligned to the demands of the classroom, for example on study skills or math's support)
- Academic and social support (promoting classroom engagement and cooperative learning that require students to work together and become active and responsible for their learning)
- Assessment and feedback (frequent to promote student success)

References:
Tinto, V. (2012). Enhancing student success: Taking the classroom success seriously. *The International Journal of the First Year in Higher Education*, Vol 3, Issue 1, pp. 1-8.

Tinto, V. (2010). ”From theory to Action: Exploring the Institutional Conditions for Student Retention”. In J.C. Smart (Ed), *Higher Education: Handbook of Theory and Research 25*, (pp. 51-89).
University of Chicago.

What measures go beyond teaching duties and who is responsible for them?

- Teachers and Academic Staff are essential when it comes to promote student success
- Other staff e.g. student counsellors and administrative staff are also important
- All staff should preferably be involved in introducing new students
- Older students, student union and associations can also contribute

http://www.attractproject.org/

Enhance the Attractiveness of Studies in Science and Technology

German Rectors Conference – International Engineering
October 29th 2012

Mats Hanson
KTH Royal Institute of Technology

Via ATTRACT it is our intention

to discuss and conduct development work within four different areas:

- **The attractiveness of being an engineer**
- Formal hinders/barriers
- Attracting students to studies in science and technology /engineering education
- Student retention – including
  First semesters experience

Setting the scene
The first phase 2010/2011 (WP5)

- **Defining an Engineer- the Engineering brand**
- **Perceptions on Engineering in Society**
- **Labor Market for Engineers**
- **Media Coverage**

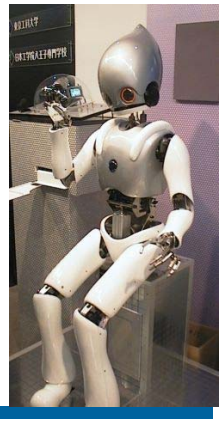
I. Defining an Engineer

“professional practitioner of engineering, concerned with applying scientific knowledge, mathematics and ingenuity to develop solutions for technical problems”.

Wikipedia

Defining an Engineer

- **Professional practitioner of engineering,**
- **Formal requirement or certificate to work as an engineer is different from country to country**
  - Chartered engineer
  - External accreditation body
  - National accreditation body



Competencies and skills of future engineers

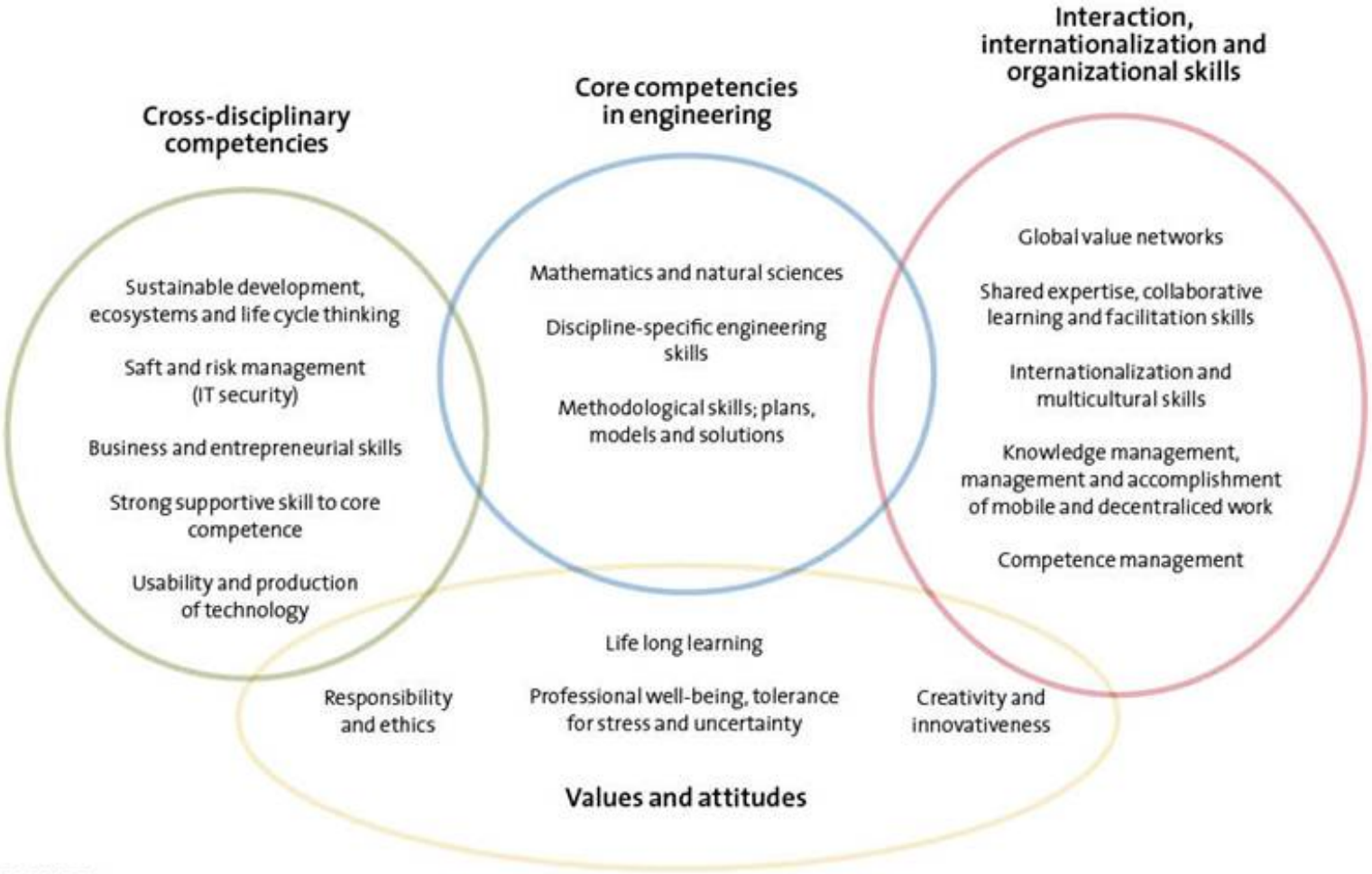
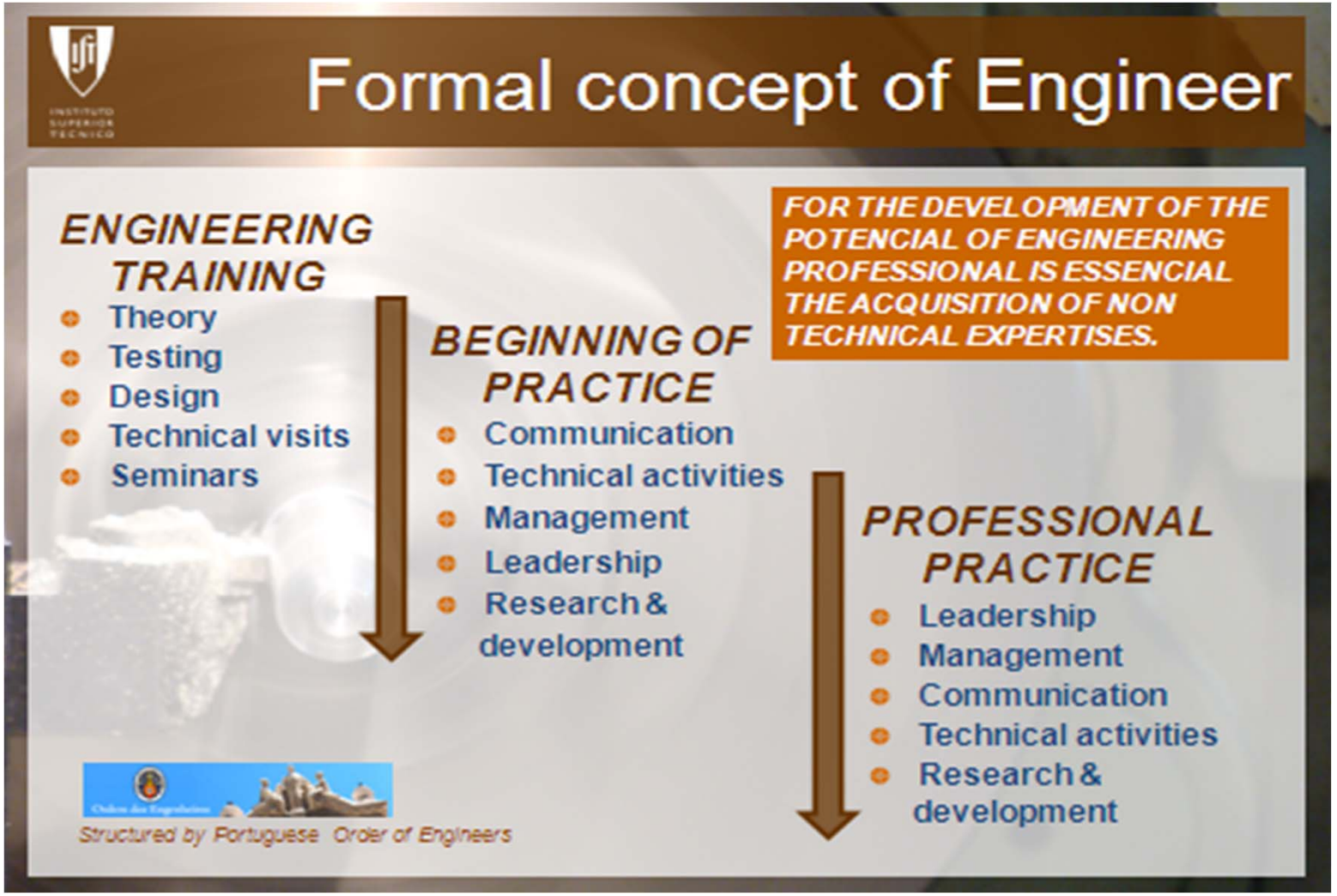


FIGURE 1.
Competencies and skills of future engineers. Source: Mielityinen 2010.

Formal of concept structured by Portuguese Order of Engineers, 2010



Academic and Vocational Engineers by different education

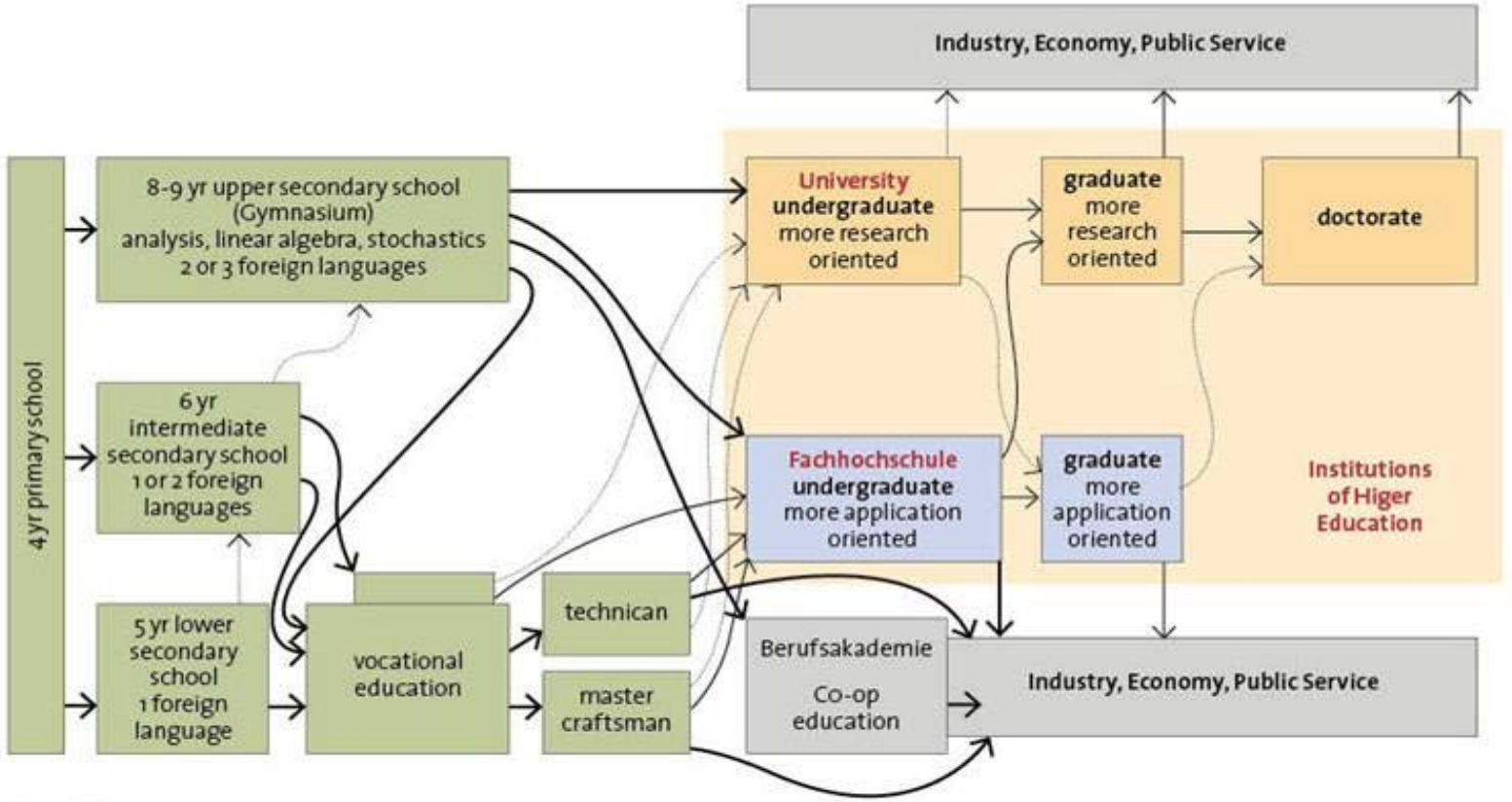


FIGURE 5.

CESAER-Declaration-Picture Unterschied zwischen universitärem und Hochschulstudium. Educational System for engineers in Germany (Hampe, presentation: EU-US Partnerships to Attract Young Talent – The TU Darmstadt – Virginia Tech Example [10].

II. Perceptions on Engineering in Society

ATTRACT

Education and Culture DG
Lifelong Learning Programme

Positive Views on Engineering
in Finland

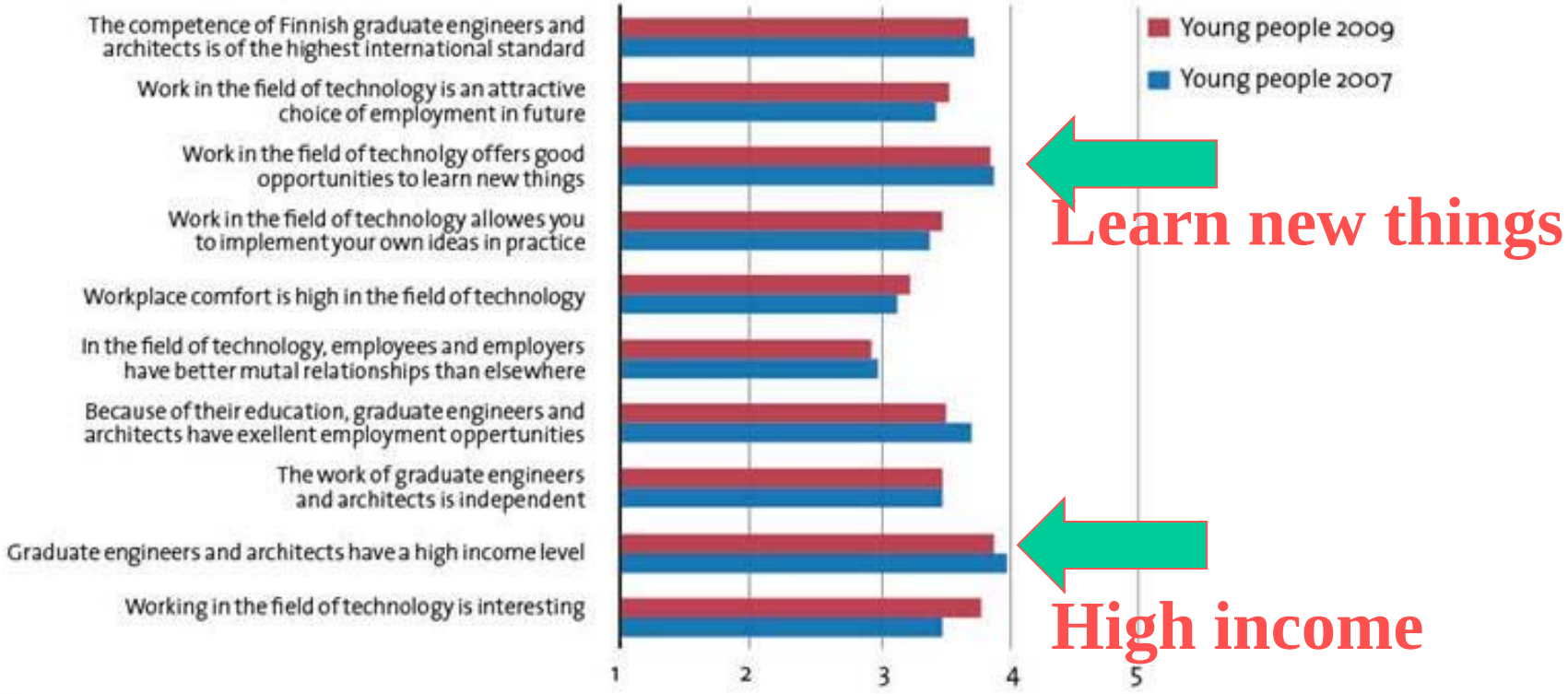
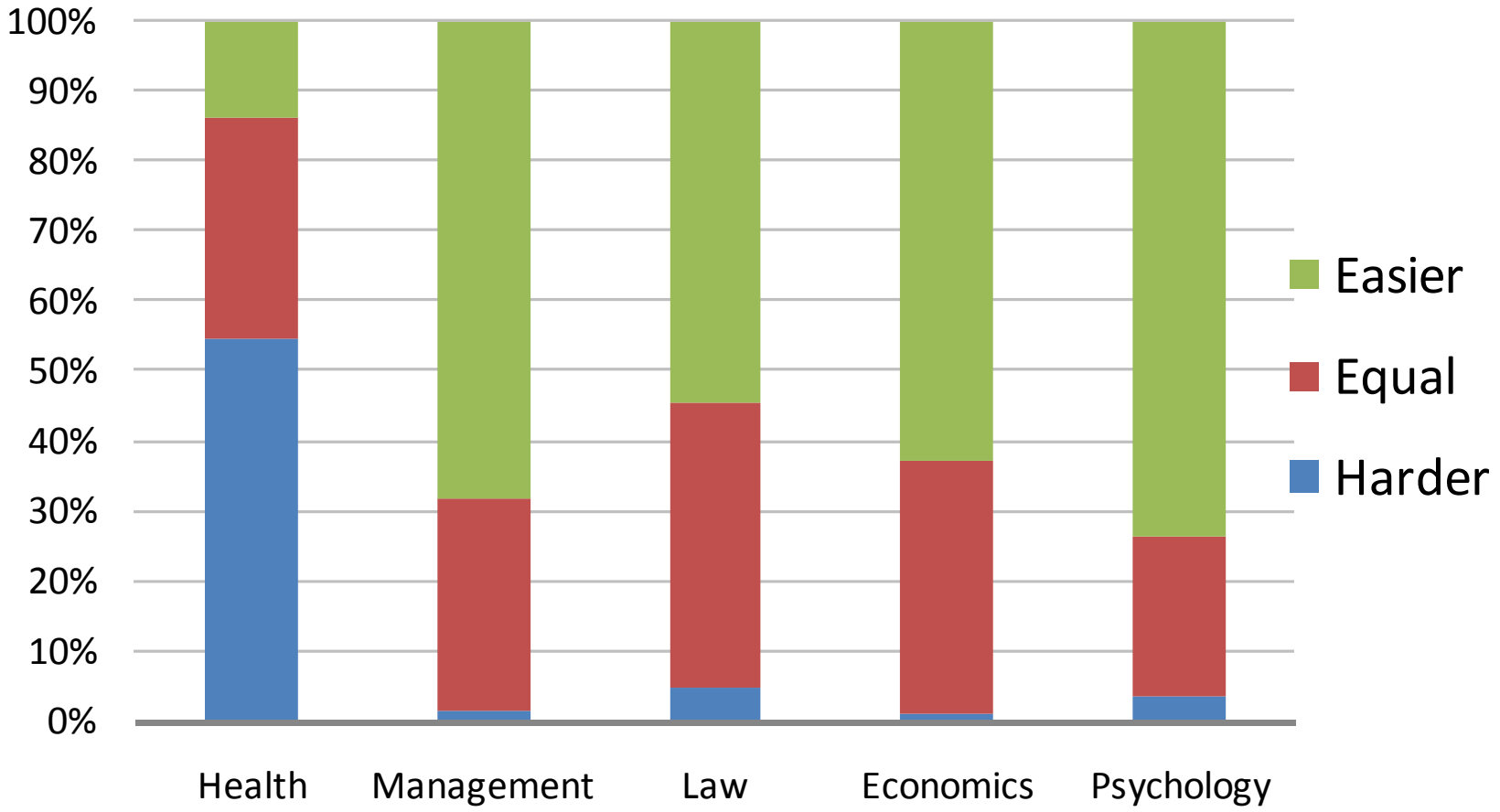


FIGURE 7.

List of statements on working in the field of technology, plus typical features of engineering work 5 = Agree entirely, 4 = Agree by and large, 3 = Difficult to say, 2 = Disagree by and large, 1 = Disagree entirely).
Source: TECHBARO 2010

Engineering and Health is hard to studdy



Freshmen and graduates over the years in Germany is increasing but drop out rate high

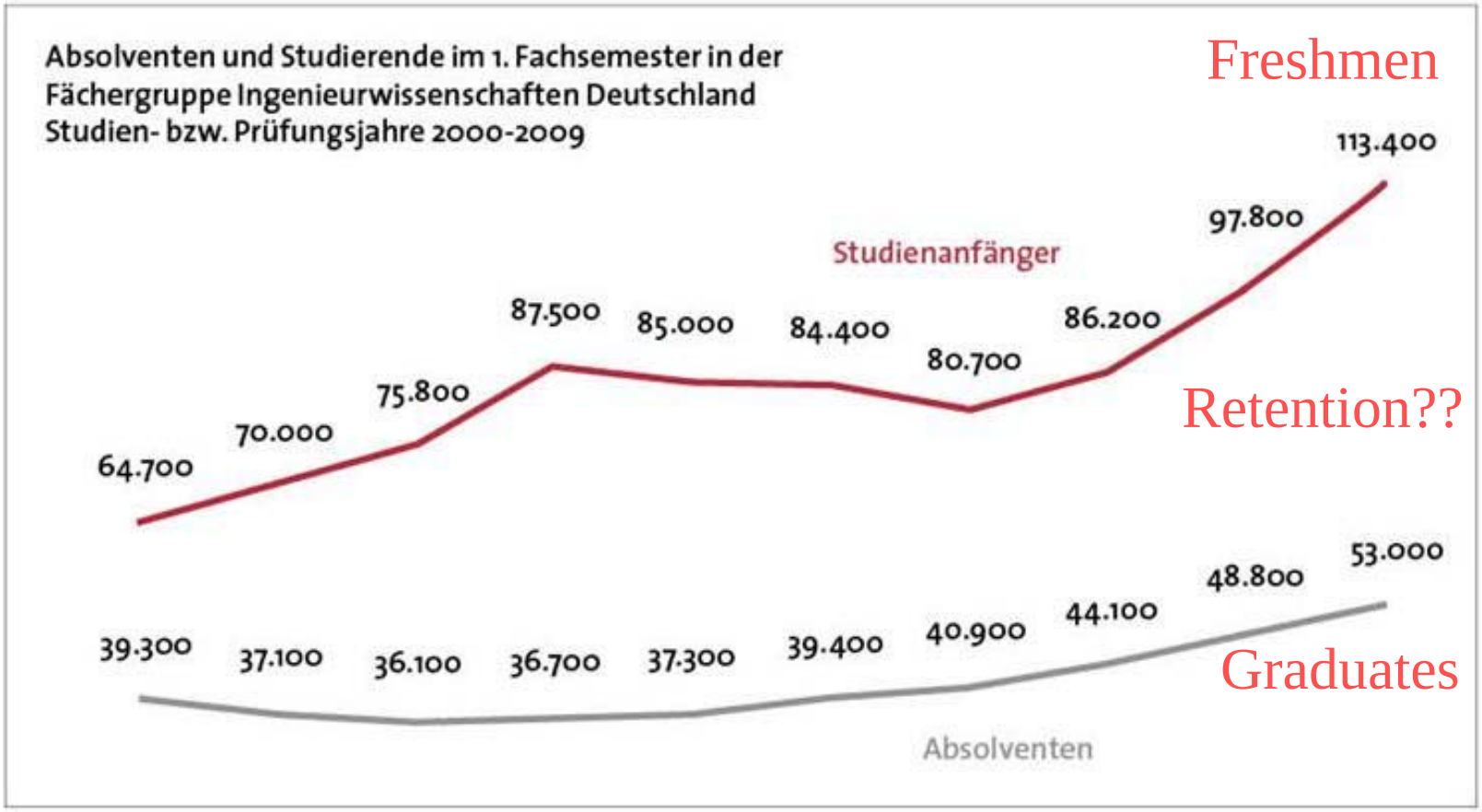


FIGURE 8.

Freshmen and graduates over the years Ref. Studien –bzw Prufungsjahre 2000-2009

III. Labour Market for Engineers

Labour Market for Engineers lessons learned

- One important action point in attracting students to the engineering areas is to show them that it does pay off to be an engineer. Not only in terms of economy capital but also when it comes to social or cultural capital.
- Each country has own characteristics and particular social, economic and political contexts, and therefore has different focus when analysing the labour market. The statistics from respective country has therefore to be compared with a little care.

Labour Market for Engineers lessons learned

- There is a shortage of engineers in several fields. So the labour market look good for most countries.

Breakdown of unemployment rates among engineers (France)

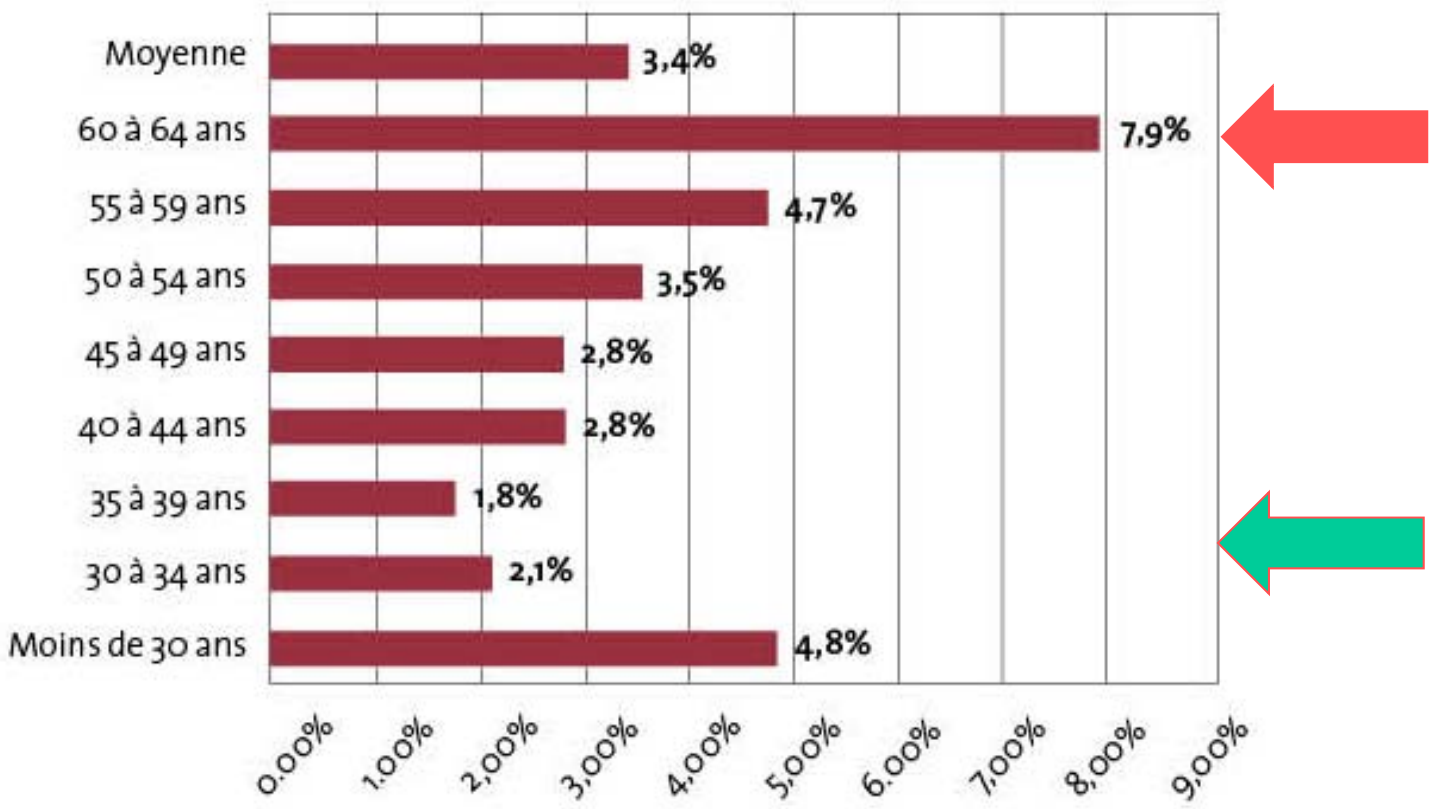


FIGURE 9.

Breakdown of unemployment rates among engineers (source: CNISF)

IV. Engineers and Media

Engineers and Media

- We have to:
- create interesting stories – braking news
- be more active outside the univeristy
- show or act as role models

Final comments

To recruit more talent and motivated students to engineering education we need to:

- change the perceptions of engineers -> from a “xxx” to a social, open minded female/male engineer who leads the development to solve global problem for a better world
- encourage students interests for deep knowledge in technology fundamentals in parallel with personal and interpersonal skills.
- tell students that Engineering Education is demanding, fun and give pay back in terms of good job opportunities.
- get more Engineers as “stars” and “role models”.


Thank You