

Wrap-up break-out sessions



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SEFI

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Europäische Gesellschaft für Ingenieur-Ausbildung
Société Européenne pour la Formation des Ingénieurs

THEME 1. University-Business collaboration: towards a meaningful student experience

Students perspective

- › *So... what is the meaning of meaning(ful)?*
- › Collaboration based projects
- › **Real world problems** & their **solutions**; conceptual thinking
- › Multiple choices & **diversity** during study years
- › **Guidance** and support for choosing:
 - › Mentoring (university supervisors, alumni, industry representatives)
 - › Supporting mechanisms
- › Explain the **why** behind everything
- › Fundamentals more relevant & connected with **practical** needs and experience + more innovative ways of delivering the knowledge
- › Travelling & relocation for experiences (Erasmus, alignment of curriculum & internships)

Internships

- › **Matching** internships to students:
 - › Based on interests
 - › Based on grades (from a pool of companies who specifically offer internships)
- › Faculty **supervision** of the students' activities
- › Faculty and industry agreeing on **learning objectives** -> University **supporting** companies in matching activities with the curriculum
- › Students already have a job during their study years (late evening classes)
- › Compulsory vs. Non-compulsory, but shifted to thesis (e.g. Lund)

Industry in academia

- › **Why** would the companies invest resources for this?
 - › Early access to talent
 - › It's part of the company's mission
 - › Contribution to new ideas and innovation
- › **Format** matters: lectures (-) vs. Innovation, learning centres & design factories (+)
- › Having the **right people** from the industry
- › *Academic and industry fairs*: companies & students with thesis have stalls
- › **Entrepreneurship** (hackathons, mentoring, accelerators)

- › Formats
 - › Mix of methods
 - › Lectures from industry – courses by industrialists – co-teaching ac-ind. – internships – based on personal contacts & trust
- › PBL – difficult:
 - › some students are too passive; students will not master all knowledge we usually teach – changes mentality of teaching – expensive.
- › Competitions – hackathons – etc.
 - › Very successful – bottom up – need for infrastructure – extra curricular or embedded in projects – entrepreneurial
- › Portfolio of acquired competences
- › Reflection
 - › Peer assisted learning: they learn about group dynamics
 - › Before and after internship: reflect on competences expected / learned

- › UK internship
 - › 12 months
 - › 4 weeks is difficult to offer
 - › Benefit from doing it in between your studies: you get back a lot more mature, more motivated

- › Discussion on “Meaningful experience”
 - › Students should realize something, feel “*this is fantastic what I did*”
 - › Students can solve a problem that is important for society (big challenges)
 - › Being proud of what they made (in competitions)

- › Internship can add to this
 - › Some topics of projects can be brought in by industry



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THEME 2. Mobility of Faculty Staff. Exploring the world outside of the Alma mater

Why would industry want an academic back?

› For:

- › Academics can be innovative; a useful addition to a team
- › Opportunity to promote the company in hiring the best graduates
- › Easier access to the knowledge and skills of other staff in the university
- › Improved reputation for the company if the academic has a high-profile

› Against:

- › Too specialised, may not be a good fit within the company.
- › May be a more difficult to integrate into a team?
- › Concerns over loss of IP/secretcy
- › Legal issues in some countries, academic staff are state employees,

Why would an academic want to go back to industry?

› For:

- › Better pay and rewards
- › An opportunity to enhance their knowledge and skills
- › Opportunity to develop and commercialise a personal idea in a start-up,
- › A chance for a lifestyle change
- › In some cases satisfy a university rule about needing industry experience

› Against:

- › Academics are risk averse!
- › Do not want to give up autonomy, freedom – the reasons they joined...
- › Worried about reduced status in industry
- › Risk of damage to their academic career
- › Much of the above depends on the period to be spent in industry

Why would universities want staff to go to industry?

› For:

- › Delivers a strong contact in industry
- › Improved reputation for the university as “industry focussed”
- › Staff get stuck, very specialised: a way to update knowledge/skills of your staff
- › A way to deal with major changes in a particular sector/industry

› Against:

- › Good staff are employed long term by industry and never return to the university
- › Concerns over costs, if costs are shared with industry
- › Lack of understanding by the university on the motivation of the staff member
- › Concerns over damage to university IP

› Finally:

- › The duration of the industry sabbatical is critical to much of the above



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THEME 3: Personal Mobility of business professionals: Climbing the ivory tower

Should there be an incoming flow ind -> univ

- › Yes: for diversity – experience positive for attracting funding – cross fertilization, fundamental accelerator.
- › Industry is in favor!
- › BUT:
 - › Problem of culture: 2 separate careers; “hole” in acad. career is seen as negative
 - › Hiring people from ind.: Requirements (publica. ...) make it difficult to hire them
 - › Part time professors: Risk of independence from industry
 - › Problem: people want job safety (after they are 40 ...)
- › For technical knowhow:
 - › Use guest professors
- › Sabbatical from industry to university offers possibilities

What does the university offer

- › Some countries
 - › There is flexibility for salaries (but some countries No flexibility at all!)
 - › 3 years – 6 years part time in university
 - › To coach PhD students, Master students,
- › In general:
 - › Freedom -- research environment
 - › Enthusiastic students

Possible solutions

- › New type of career possibilities in universities
 - › Practical also: HR of Univ need to be prepared for this
- › Have companies promise to take people back after 5 years (such as it is in the other direction)
- › Objective evaluation criteria

PREVIOUS EXPERIENCES

- › Under contract with banks or private companies that fund activities with the University. It is more based on a personal position
- › Young professors in industry financed by the company. It is usually appointed for 3 years
- › Industrial professionals coming from high level laboratories coming back to the university
- › Assistant professors from industry and paid by the University. It is more and individual challenge than a company bet.

Questions or uncertainties

- › Are there structured experiences?
- › What are the possibilities to have people come back to Universities?
- › Is it possible to have successful tracks?

Some potential measurements or lines

- › Incoming mobility is fantastic but enthusiasm of people is not so high perhaps because they are competing for the same goal
- › The tenure system should promote mobility
- › More flexibility in career developments.
- › Promotion of mobility by the governments in regulations
- › Foster spin-offs or accelerators to have young professionals effectively dealing with the duality industry-academia.
- › Duality programs.

What about the future?

- › Incoming mobility is fantastic
- › Do we see hope for the future? This same debate is a hopeful sign but
- › Measurements fostering a real mobility and duality programs should be taken.

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THEME 4. The academic PhD: Lost in limbo or a perfect start to a career in industry?



Questions: justification of the doctorate as a full career path

- › All agree that PhD prepares also to industry and that soft skills are taught/proposed.
- › Many students choose PhD with industry collaboration, as this is the way to attract them to university research. Also, pure science PhDs find jobs with more difficulty in industry, whereas all options remain for more applied PhDs.
- › Interest of “industrial “PhD, like in Germany that can be done while on the job in industry? Yes if well monitored, no as the pure research experience and freedom is not there.
- › Try to connect PhD studies with meaningful impact, for example the SDG, helps to increase university rankings but also helps to increase pressure on the supervisors in getting the broader mindset and how we contribute to these goals (Social entrepreneurship).
- › Inflation of PhD graduate numbers, easy to get now in some domains, maybe not in top schools. Should this be reduced? (UK, PhD alumni altogether are less than current number of PhD students), is it also a way for companies to subcontract research at a lower cost or on expensive equipment?
- › Contradiction: number of PhD students increased a lot, but we continue to ask for more money to hire more PhD? Or should we have more money to help them to get ready for academy/industry jobs, with bringing year for those who can bring their research to industry?

Questions: runway for academic career or what is the added value for the labor market?

- › EU/world statistics would be needed to find for companies, what is the proportion of PhDs and how it evolved, who has the leadership roles? There are large differences between countries (D, CH, A versus F, B..), and industry types.
- › Statistics also needed for start-up companies, how many created by PhD graduates? Seems like the number has increased greatly in the recent years, lots of incentives, and required skills are acquired at the PhD (but need a marketing/business/product partner to succeed!)
- › Needs of companies: do they see a benefit to PhD and if not, why? Why are countries different in this judgement, is it only cultural, or due to the educational system? Most jobs taken by PhD in fact do not need a PhD graduate and were open to Master/Phd.
- › Clear added value for some companies, who need highly skilled, cutting-edge people (security, those relying on research, etc), or mixed backgrounds (AI and pharmacy..). Not so clear for highly growing companies, like in computer science, companies are the place to be now, and deal with fun problems and pay well.
- › Partnership between university (METU example) and companies to organize PhD+work in industry (longer engagement but a direct mix)

An academic PhD, a perfect start ?

- › Huge number of PhD's (e.g. in Germany, up to 90%) goes into industry.
 - › In some countries (e.g. Germany, ticket to high level functions).
- › Perfect start → It can, but not necessarily !
 - › For some functions/jobs
 - › Depends on the industry
 - › Different PhD roles ?
 - › ...
- › Also master degree can be a perfect start for an industry career

Industry

- › We need to educate to industry !
 - › Perception – we do not need “doctors” !
- › Industry is evolving
 - › Industries where doctors were not required in the past, could use doctors today!

Win-Win

- › Should be “Win-Win” for both (university and industry)
 - › University/professors → PhD’s required for research incentive university
 - › Industry → value of a PhD
 - › Specializations of a problem of a certain time
 - › To demonstrate successfulness in managing their own project
 - › Ability to solve specific and complex problems
 - › In some countries (e.g. Germany) → step into higher R&D/management functions
- › Structured PhD ↔ less (non) structured PhD
 - › Content defined by different modules (credit based)

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THEME 5. Symbiosis between Engineering Institutions and Industry Stakeholders in Shaping the Engineering Curriculum

Combining disciplines

Instrument: project-centric learning

- just projects in curriculum vs PBL driven institution
- from year 1, authentic, yearly engineered

Obstacles	Remedies
Problem sourcing/Bureaucracy/structures/money/ mindset of staff/accreditation	Struggling and willingness / rectors to create incentives/ inform staff about tools and studies / continuing education of educators. We need to give educators time and to learn/accreditation should recognize

- Provides knowledge and skills at the same time
- Easy in brand new programs, not in established disciplines.

Co-creating with corporate

Information vs Knowledge vs Skill vs Competence etc...

Time and project management collision:

- › By comparison with industry (I worked there) most people in University are not time driven. It must have something to do with research (I worked there). Our research is just for the benefit of education.
- › Academia should evaluate knowledge before providing it. This takes time.

Information vs Knowledge vs Skill vs Competence etc...

Easy in brand new programs, not in established disciplines.

Co-creation in curriculum definition, not in design

Alumni associated in co-creation involve their companies