

ELECTRICAL POWER ENGINEERING EDUCATION: HOW TO BRIDGE THE GAP BETWEEN INDUSTRY AND UNIVERSITIES

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Question 1 – What level of specialization of engineering curricula should be sought for? Is basic, fundamentals knowledge more formative and potentially more effective for industry than up-to-date information ?

- The knowledge in the field is ever exploding
 - New materials, Renewables, Power Electronics, Algorithms, Big Data, Control, IT, Markets, ...
- It is absolutely impossible to cover everything in graduate courses
- Up-to-date information is ageing ever faster
- Basic fundamental knowledge is a MUST!
 - Enable life-long learning
 - Enable scientific working style
- Avoid too narrow specialization
- **This is no excuse for outdated courses!**



Question 2 – What are the differences between Industry needs and expectations and Academia ones ?

- There always was and always will be a gap between Industry expectations and what Universities can deliver
- Most engineers will not work in science or R&D but in
 - Production
 - Project management
 - Product management
 - Sales
 - Quality management
 - Controlling
 - Administration
 - General management
- Skills requires are typically not being taught at Universities
 - **Industry must bridge the gap according to the specific needs**



Question 3 – What are the reasons behind the gap between Academia and Industry, if any ?

- There are significant gaps, see Q2
- However, there is nothing like “The Industry”
 - Job requirements are extremely manifold and diverse
- Universities need to find the “gravity centre”
 - This is a moving target
- But:
There is nothing more practical than a good theory!



Question 4 – What is the current status of cooperation between Academia and Industry and in particular the interaction between industry and undergraduate/doctoral programs ?

- In the power system field there is a very tight cooperation
 - Traditionally high number of joint R&D and pilot projects
 - Significant project funding by industry
 - Further increasing driven by the paradigm shift
- Some caution is necessary to **safeguard scientific principles**



Question 5 – Is at present the number of PhDs produced every year for the higher education establishment too much to be absorbed by Industry?

- No!
- There is a very high demand of power engineers of whatever qualification
- Question is whether spending time on a PhD thesis is still attractive and pays off for the career



Question 6 – Should industry be involved in the management of Educational Establishments?

- Yes
 - in an advisory role
 - but keep independence of Academia!
- Industry participation, e.g. in an advisory board, may help
 - to define long-term strategies
 - to keep up-to-date
 - to enable fundraising



Item 7 – Should industry representatives be involved in teaching?

- Yes, to a certain extent
- Special courses on specific topics can help to
 - broaden the course offerings
 - give students more insight into industry practices
- Not suitable for basic main courses
- **Careful selection and quality supervision is mandatory**



Conclusions

- Career prospects for power engineers are excellent
- Don't be too afraid of (unavoidable) gaps
- Provide solid up-to-date technical know-how and working skills
- Some domain factual knowledge is no disadvantage
- Don't follow hypes

Thank you for your attention

