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Teaching and supervision Experience

2019	Build Mechatronic Products that can move
2018	Experts in Teams
2018	Fastening and Joining Methods
2018	Mechatronics Design and Build 2

Lecturer Training

2019	Supervision, roles and relations

Teaching Philosophy

My interest in teaching comes from my experience as an undergraduate, researcher and engineering consultant. It also stems from a belief that engineering issues are intricately connected with a lack of knowledge about real-world applications of scientific theories. I certainly believe that industrial and academic works are two closely related aspects rather than two separate paths. I have four main teaching goals: concepts, applications, engagement, and teamwork.

Concepts & applications: During my first year of teaching, I found out that many students do not have a deep understanding of basic concepts like “moment of inertia”, “vector”, “matrix”, etc. While they know how to use these concepts to solve problems, they don’t know where these concepts are coming from and why. This lack of deep understanding leads to a weak “Engineering Way of Thinking”. Therefore, I always start by solving problems without using these basic concepts and eventually they realize where these concepts are coming from and why they are useful. I deeply believe that even the most complicated concepts are easy to understand if the students follow the way the concept discovered for the first time and how it evolved during time. Navier-stokes is a good example. It may be reasonable to show the equation and explain each term separately, but I derive this equation from Newton's second law. This way, the students can see how it is possible to analyze the complicated behavior of fluids by applying the very basic laws they have learned in the high school.

Engagement: students engage with the material and retain the most information when they see a connection that makes the ideas relevant to them. When teaching “Fastening and joining methods” to mechatronics students at SDU, I provided practice problems in class that related to problems they might encounter as mechatronics engineers. My industrial connection made it possible for me to bring my own projects to the class and try to discuss them with the students. I realized that more students engage in learning if the focus is on a current challenge in the industry. I explained a fastening method needed to hold very large banners in the Tokyo Disneyland that I recently designed. I have seen their motivation to learn about it while looking for different solutions.Moreover, supervising different projects at SDU gave me a good chance to learn SOLO taxonomy and utilize it to describe levels of increasing complexity in student's understanding of subjects based on individual reports and level of engagement.

Teamwork: Effective teamwork is the basis for most modern technical operations whether it’s a project, product development, production line, maintenance or a manufacturing cell. However, teamwork is not necessarily effective! If the task is not divided correctly or the team is not made up of people with different but complementary skills, teamwork ends with failure for everyone. Therefore, it’s important to teach engineers how to participate in a team. I supervised two teams in a course called “Experts in teams” where the students should make a team, formulate the problem given by the company, provide possible solutions and finally deliver the project. During team making, I got the chance to learn and utilize the Belbin test which was offered by one of the participating companies. As a result, the students were able to construct a balanced team knowing their individual style or role as an engineer.