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Learning to love problems

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By: Inken De Wit | 1 Comment

How can students from a wide range of departments grow as a team and work together to solve a problem in six days? ETH News shadowed a student at this year's edition of ETH Week, entitled "Manufacturing the future".



The newly formed Team 7 in discussion on the first day of ETH Week 2017. (Photograph: ETH Zurich / Alessandro Della Bella)

At the beginning, everything is plain sailing. Noëmi Kaufmann, a Master's student in Materials Science, is delighted to be taking part in ETH Week 2017 from 10 to 15 September 2017. "The theme 'manufacturing the future' is right up my street," she says on Sunday, the first day of ETH Week. "I'm excited about the future of manufacturing and look forward to helping to shape it. I'd like to work with my team to develop innovative ideas this week." The 22-year-old already wanted to take part last year, but there were no places left. This time, in the third edition of ETH Week, she secured her place as one of the 180 participants. Finally.

Over the course of six days, Kaufmann and her small group of nine other Bachelor's, Master's and exchange students will learn more about factories, resources and the relationship between humans and machines. The packed programme includes numerous company visits and expert talks as well as sporting events and communal evening activities.

The organisers have ensured that the participants are divided into the most interdisciplinary and multicultural teams possible. The course doesn't just aim to teach students facts – its main objective is to encourage critical thinking and mental agility in line with the university's Critical Thinking Initiative. So it's no surprise that the students in Kaufmann's Team 7 come from fields as diverse as computer science, mathematics, molecular biology, as well as environmental and electrical engineering. The Swiss students are also joined by counterparts from Sweden, Brazil, China, Austria and Germany.

It's all falling apart



Master's student in Material Sciences Noëmi Kaufmann (centre) discusses innovation and design thinking with a representative of SAP. (Photograph: ETH Zurich / Alessandro Della Bella)

Up until Thursday lunchtime, the team was certain that they'd found an exciting problem and the appropriate solution. They wanted to use augmented reality glasses to teach technicians how to use new production machinery. The glasses would help older employees in particular to keep their jobs and to maintain and repair the machines. This would also benefit the machine manufacturers, as they wouldn't need to send their own technicians to the production sites. At least that was the team's argument.

But during the feedback session with experts, the students are not able to convince them of their idea. The experts point out that automation and remote maintenance will change the maintenance of machines on site considerably in the future. They also question the hypothesis that machine manufacturers no longer want to send their own technicians. For the team, the experts' analysis is devastating.

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Pressure reaches breaking point

So back to square one. The time pressure, which Noëmi Kaufmann thought on Tuesday would help to keep them focussed, has reached breaking point. Tutor Fabio Bargardi – who along with the other ETH Week tutors was trained in how to support the teams – has to keep the ten students motivated. And he succeeds. "Today was the most productive day of the week," says team member Max Grüner, a Master's student in Computer Science, on Friday evening.

In less than a week, the students have grown together and worked together as a team, even in the face of intense pressure – an achievement that some of the group were still calling into question just one day earlier. "There are several leaders in our group," explained Santiago Walliser, who wants to do a Master's in Computer Science after he completes his Bachelor's in Economics. "And when several people lead at the same time, it doesn't work." To reduce tension in the team, the group ultimately decided to split up and work on different aspects of the project in twos or threes.



Team 7 developed the "reSkill" idea, in which robots are used to help retrain technicians to care for elderly people. (Photograph: ETH Zurich / Alessandro Della Bella)



Noëmi Kaufmann and Gian Luca Cola at the final presentation. (Photograph: ETH Zurich / Alessandro Della Bella)

A successful presentation

The result is impressive. When Team 7 is called up to the stage at 4 pm on Friday, its presentation is ready, and the group presents its "reSkill" idea as adeptly as the other 17 teams. The concept: technicians, whose jobs will increasingly be taken over by automated production processes in the years ahead, will be trained to care for older people with the help of robots. Using augmented reality glasses, the engineers will learn both how to deal with the elderly and how to operate the robots, thus keeping them in the work process and ensuring that older people are cared for in our ageing population.

When asked what she had learned during the ETH Week, Kaufmann was almost lost for words. "An unbelievable amount," she says, adding: "As a materials science student, I had a great deal of prior knowledge. I therefore gained less new technical knowledge than expected, but instead learned how to approach a problem, define it more and more precisely, and solve it together in a team." The organisers of the event could hardly have wished for a better result – as project leader Lex Schaul said to the participants at the start of the week: "Learn how to love questions and problems, instead of immediately looking for solutions. You can only find the right answers if you ask the crucial questions."

ETH Week 2017 in brief

From 10 to 15 September 2017, 180 Bachelor's, Master's and exchange students took part in the ETH Week, divided into 18 teams. They were supported by tutors. ETH Week 2017 was organised by ETH Sustainability, the central hub for coordinating sustainability activities at ETH Zurich, the Competence Centre for Materials and Processes (MaP) and the Chair of Technology and Innovation Management.

Impressions of the ETH Week 2017



(all photographs: ETH Zurich / Alessandro Della Bella)

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**Marie-Claire &
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21.09.2017
11:39

For us and our teams this week was truly unique in many ways. It inspired us, it challenged us, it helped us to think further and it gave us the opportunity to work on a problem and create something together with people from across ETH but also across the world. We especially enjoyed the interdisciplinarity of the team and the high quality of speeches, inputs, panels, excursions and tutors as well as facilitators throughout the event! I hope we will be able to improve ourselves and our organisation, the Sustainability Week at five Universities of Zurich with the new learned skills and do a better job, inspired by you!

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