



## Focusing on Practical Application

### Steinbeis advises Normal University in China

Steinbeis goes deeper into China: Prof. Dr.-Ing. Peter Eichinger and Prof. Dr.-Ing. Ulrich Schmitt, experts at the Steinbeis Transfer Center for Mechatronics at Aalen University of Applied Sciences, have been providing support and transfer advice of an international nature to Normal University in Tianshui, in the Chinese province of Gansu. The two experts received an invitation from Chinese colleagues to draw on their expertise and practical experience for recently redesigned degree programs in automation technology, automotive engineering, and mechatronics.

Tianshui lies in the northwest of China around 1100km (680 miles) south west of Beijing. Normal University has 17,000 students and a variety of faculties such as civil engineering, electrical engineering, education, and mechanical engineering. It is a wish of central government in Beijing that around half of university degrees currently offered should be restructured according to the model of German universities of applied sciences. The overall aim is to provide training matched to practical needs and business requirements by offering industry-based projects, modern teaching methods such as problem-based learning, degree modules based on the Bologna Process used in Europe, and a general overhaul of degree subjects.

It is in this area, and in forging networks in industry, that the Steinbeis experts from Aalen have a valuable contribution to make, thanks to decades of experience with industry. And it was this specific background that they were looking for in Tianshui, not only for the faculty of electromechanics and automobile engineering, but also for degree programs in automation technology, automotive engineering, and mechatronics. It was the university that approached the Steinbeis Transfer Center, inviting Peter Eichinger and Ulrich Schmitt to take a look at the Chinese laboratories and equipment, and discuss possible concepts for the future with professors and lecturers.

The two experienced experts from Aalen spent a week in Tianshui to take an objective look both at the situation in the faculty and the degree programs. The laboratory setups are completely different from equipment found in German universities because there is absolutely no contact to organizations in industry. In contrast to German practice, in China students go on a pre-study internship before attending university. The material testing, metallography, and sensor system laboratories are on a par with standards in the fundamentals laboratory in Aalen.

The students in China are given no tasks to work on as part of a project, something where they have to use their own initiative. Instead, they are usually given strictly defined experiments to carry out step by step. The professors from Aalen made it clear to their colleagues in China that there is an extremely limited amount to learn from such methods, recommending a distinction between fundamentals and in-depth learning. After basic training on certain techniques and methods, the students now work in small teams as part of in-depth modules, solving tasks related to modern topics. The professors watch and act as mentors or coaches. This approach to problem-based learning is used widely on the mechatronics degree program at Aalen University of Applied Sciences. Students gain a much better grasp of topics and find it easier to implement ideas in their subsequent work environment.

The recommendations made by the German professors also include setting up a new degree in mechatronics and automation technology in order to focus on future fields. Academic training should always establish a solid basis and training on the essential fundamentals plus method skills. Hot topics such as product lifecycle management (PLM), additive manufacturing (3D printing), and smart production (Industry 4.0) should be included in the curriculum as this will prepare graduates better for the future, give them up-to-the-minute training, and prepare for mastering future challenges. The Steinbeis experts from Aalen explained to their colleagues in China that modern and practice-based education is only possible with contacts in industry, applied research, and technology transfer, urging the professors in Tianshui to seek contact to local companies and get to know their problems and challenges. This fuels new ideas and impetus, also for teaching at the university.

Thinking about the trip, Peter Eichinger says, "The interest and the thirst for knowledge about the system at German universities and the technology transfer model advocated by Steinbeis was unbelievably strong here at Normal University Tianshui. We'll be interested to see how our Chinese colleagues take our recommendations forward and implement them." His conclusion: "This won't be our last visit to China."

**Image:** Prof. Dr.-Ing. Peter Eichinger talking to Chinese students



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