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GLOBE

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More communication

Teaching at ETH has changed significantly in recent years. This change has been driven by the professors themselves, with some support from digital technologies.

Text Roland Baumann

Daniel Halter (left) and Andreas Vaterlaus in the newly established ETH recording studio, where videos for MOOCs and TORQUEs are created.

Photo: Daniel Winkler

The discussions and speculation surrounding massive open online courses (MOOCs) might give the impression that the world of teaching is in the midst of a revolution – one that is turning universities upside down, perhaps even making them superfluous. Some argue that we can gather knowledge from the internet whenever we need it – education on demand, as it were. The change isn't really that dramatic, but thanks to things such as digital technologies, teaching at ETH has changed significantly, too. So would an alumna who completed her studies 20 years ago be able to find her way in today's teaching environment?

More interaction

Andreas Vaterlaus, Professor of Physics, feels that, "generally speaking, an alumna would indeed recognise teaching in its current form." As Vice-Rector for Curriculum Development, he guides the continued development of teaching at ETH. "What has changed is how information is maintained and accessed, and in a certain sense, there's now an opportunity to give and receive feedback. Instruction has become more interactive," he says.

When an alumna walks into a lecture theatre today, what she most likely notices first is that there are far more students sitting there. The number of students at ETH has grown by around 70 percent over the past two decades. And yet there is more interaction? "The EduApp has had a major impact here," Vaterlaus explains. Developed by ETH, this application lets lecturers pose questions that students can answer on their smartphones. The distribution of responses is displayed immediately and forms the basis for subsequent discussion. Students, too, can transmit questions that instructors then address at the end of the lecture. In this way, technical aids are helping to make instruction more interactive.

But what is it like outside the lecture theatre? Vaterlaus contends that "students have access to much more information than before," and illustrates this with an example from introductory physics classes, where students are shown many experiments. It can happen that someone misses the key step, but as Vaterlaus explains, "nowadays ETH provides online videos with an accompanying description for many experiments." Students who miss a class or an experiment can watch these videos, or even recordings of entire lectures.

New technology, new teaching formats

And sometimes they do so even before they attend the class: as particularly for large lecture courses, some instructors today record their teaching material on video. Rather than being stuck in row 25 of the auditorium as student number 465, students can watch the video clips at home. In-class time is then devoted to discussing and applying the newly learned material. This format is known as the "flipped classroom". At ETH, such online courses are called TORQUEs – Tiny, Open-with-Restrictions courses focused on QUality and Effectiveness – to distinguish them from the MOOCs mentioned above. "These courses help lecturers establish a more direct line of communication to their students," explains Daniel Halter, head of the Educational Development and Technology (LET) unit. Halter and his team help ETH professors develop new teaching formats.

Of course there is no reason why these videos shouldn't also be made available to the public. Or why publicly available MOOCs shouldn't be used in the classroom, which is also common practice at ETH. "Digitalisation enables us to combine in-class instruction and personalised learning. It allows instructors to register individual performance and reward specific learning progress even in large classes," explains Halter.

Fostering innovation

But how often are formats like this used? "Maybe in 10 percent of all courses," Vaterlaus estimates, and immediately adds that students wouldn't be able to manage more than that. As he explains, "we are already receiving feedback indicating that even just the material ETH puts online for internal use is too much for students to make full use of."

The driving force behind this development is the professors themselves. They enjoy a great deal of freedom in designing their courses, with incentives constituting the primary means of guiding their choices. The Rector has a special fund which fosters innovation in teaching. Projects undertaken by individual professors – such as the flipped classroom – and degree programme initiatives that rework entire curricula are equally eligible for funding. In addition, prizes such as the recently launched KITE Award, which recognises innovative teaching concepts (see article in "Connected" on page 47), provide incentives to take teaching to the next level.

Good teaching is the goal

After all, digitalisation and innovation are never ends in themselves, but the means by which teaching can be improved. This is also evidenced by the teaching evaluations that students submit to the Rector. "Those who use conventional classroom instruction techniques can also receive very positive feedback," says Halter. However, if an assessment is poor, the professor needs to rethink the course – and this is where Halter's unit can offer assistance. "This feedback mechanism helps identify and address weaknesses in teaching," explains Vaterlaus.

And herein lies the greatest change. "During my university days, it would have been inconceivable for students to officially assess faculty members," Halter says. Focusing on students changes the teaching relationship. "In the classroom, students are becoming learning partners, and professors are increasingly becoming coaches," he continues, seeing in this an actual paradigm shift. Vaterlaus, on the other hand, sees the individual steps and speaks of an evolutionary process. But the two agree that, on balance, the value placed on teaching at ETH has increased enormously. ○

ONLINE MOOC AND TORQUE COURSES

MOOCs are self-contained online courses that universities offer, largely free of charge, to a global audience. They combine short assignment videos and quizzes with interactive fora where instructors and students can connect. ETH MOOCs are published on the non-profit platform edX, which was launched by Harvard University and MIT in 2012. There are now more than 90 institutions offering courses on edX. ETH's own TORQUEs (Tiny, Open-with-Restrictions courses focused on QUality and Effectiveness) are specifically designed for individual courses and are uploaded to the open-source learning platform Moodle. Most are open to all ETH students, and some are even available to the entire Swiss university network.
→ www.edx.org/school/ethx