One size does not fit all

Tutorials are an unavoidable part of every ETH degree course. But at least students attending physics lectures are free to choose the format in which they practice the principles of their subject.

TEXT Isabel Nägele, Florian Meyer

For students of physics, there's no getting away from the fact that they will have to practice the principles they learn in lectures until they have fully understood them. This process also equips them with skills that extend far beyond theoretical knowledge and remain valuable long after their studies: they learn to quickly grasp a problem and solve it systematically. Especially in the first few semesters, this calls for highly personalised teaching and learning formats – no easy task when there are thousands of Bachelor's students at ETH needing to learn the basics of physics. "There's no one perfect tutorial for all students," says Guillaume Schiltz, the Department of Physics educational developer, "but we do take our students' learning needs seriously."

Since 2013, students in the foundation phase of their degrees have been able to choose a tutorial format that best fits their learning preferences. The "tutorial marketplace", as the model is known, offers four formats that correspond to four common learning preferences.

More personalised learning

In the "Micro teaching" format, students are taken through the most important points from the lecture, offering the opportunity to clear up any outstanding questions. This format is designed primarily for students who are still unsure about the material. "Scaffolding" represents the conventional tutorial: Students solve problems with the help of hints and pointers, and discuss their results together. The "Coaching" format offers students support according to their needs, with assistants helping them to develop personalised problem-solving approaches. Then, for those students who have already mastered the material, there is the "Masterclass" format with additional exercises for advanced students.

Tutorials take place in small groups of around 20 students, with the focus on personal interaction. All the tutorial formats emphasise feedback among lecturers, tutorial assistants and students, as this allows lecturers to ascertain where students are currently experiencing difficulty and adjust their teaching accordingly.

By giving the students the freedom to choose the tutorial format that suits them best, the tutorial marketplace encourages them to take responsibility for their learning. "Since students have little in the way of choice during their first few semesters, giving them an option is extremely motivating," explains Schiltz. Before, students were assigned their seats on a moving train that stopped only at the exam. Now, students can at least choose the compartment that appeals to them. Even so, everyone has to solve the same problems, and is given sufficient time to do so whatever the format.

Scaffolding is the most popular format, with an average of 60 percent of students opting for this traditional tutorial format. Another 30 percent choose the coaching model, while 10 percent go for micro teaching or the masterclass. The feedback is encouraging: four out of five students would like to see the model applied to other lectures. ○

Teaching concepts in the Department of Physics:
→ www.eduphys.ethz.ch/elearning

Guillaume Schiltz

Guillaume Schiltz is an educational developer within ETH Zurich's Department of Physics. The humanities scholar has worked in teaching methods for 30 years now. ETH has its own network of teaching specialists who support lecturers in their teaching activities.

Image: Heidi Hostettler