

# Using competitions to motivate students in laboratory classes

*Franz-Josef Schmitt, Universität Halle*

Competitions motivate students to get involved into internship tasks a bit further than the standard repertoire of the curricula. At FAU Erlangen-Nürnberg, students are "activated" via small, self-made mechanics experiments. With own considerations and concepts, the weight of a fly should be determined with simple equipment. Everything is allowed that the kitchen and the study room provide. From the deflection of a small balance to the change in the buoyancy of a capsule. Especially the latter idea delivers a lot of possible approaches with strongly varying accuracy.

The prize was awarded to the best idea and the most precise result for an unknown fly (which had already dried out at the time of the competition, about 20 mg).

Another example comes from the TU Berlin: In the interdisciplinary project iGEM - Synthetic Biology, students of physics, chemistry and biotechnology develop their own project according to the principle of research-based learning and then present it at an (international) competition (iGEM or BIOMOD in the USA, currently online). The students take part early in workshops and conferences to present their results to the public (e.g. during the Long Night of Science) and they exchange work results and new ideas in weekly seminars. They document their project online. In our experience, this structure activated a particularly high level of motivation with self-chosen intensive work phases.

Such competitions are perfect playgrounds for developing highly motivating research-based teaching modules. This is especially true if the scientific field as such has not yet been canonized with textbooks and best practice examples. Our experience shows that iGEM / BIOMOD competitions are an excellent basis for the design of research-based courses [1].

[1] FJ Schmitt, S Frielingsdorf, T Friedrich, N Budisa, Courses Based on iGEM/BIOMOD Competitions Are the Ideal Format for Research-Based Learning of Xenobiology, ChemBioChem, 2020, 21 <https://doi.org/10.1002/cbic.202000614>