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Differences and similarities in approaches to physics LAB-courses

Many universities attempt through their lab courses to teach students how to successfully engage in physics inquiry. It is known that doing so effectively requires students to participate in genuine inquiry: Learning to do science by doing science. Still, many different approaches can be envisioned. Should students always pose their own research questions, or should we gradually allow them more freedom? What minimum knowledge is required before they can reason with scientific evidence effectively and how do they acquire this knowledge in a meaningful way? How much time should be devoted to teaching students how to communicate their results in different formats, and how can we improve the quality of their writing? And, if we succeed in designing a course with which this broad goal can be attained, what is the workload for both students and teachers? What tools do we have to evaluate whether students master the knowledge, skills and competences that allows them to participate in more complex and independent physics inquiries in later years?

In this symposium, we compare the approaches to physics LAB-courses of four universities: University of Colorado Boulder (UCB), Amsterdam University College (AUC), Leiden University (LU) & Delft University of Technology (DUT). Each presenter will provide an outline of the approach and the rationale for it. One of the experiments or activities that is representative for the specific course will be highlighted.

Once the different labcourses have been outlined, we will discuss their similarities and differences more deeply, with specific attention to difficulties encountered and overcome. The questions and topics addressed above will be the point of departure for an engaging discussion.

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