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Virtual Versus Real Undergraduate Physics Laboratory MARIUSZ

KRASINSKI, Lodz University of Technology, Center of Mathematics and Physics, Al. Politechniki 11, 90-924 Lodz, Poland — During the COVID period, most physics undergraduate laboratories went online. In Lodz University of Technology virtual, javascript experiments for the first-year students were prepared. The physics course is a basic course for students of every engineering faculty. Using observations, surveys for students and teachers we analyze the disadvantages and advantages of this process. Some of them are surprising. Many students do not see a big difference between real and virtual experiments. What is missing is real contact with a tutor, not real experiments. This observation may suggest that these real experiments should be replaced by more challenging ones. Students have a tendency to blame virtual experiments for any inaccuracy despite the fact that virtual experiments are usually much more precise (sometimes even too precise) comparing original ones. Many teachers have a tendency to replicate the original experiments one to one, not thinking about new possibilities to increase measurement spectrum or making experiments that are not possible in the real lab due to high cost or complication. In the end, some propositions of a better use of virtual experiments in the undergraduate physics lab are presented.

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