

Online Laboratory –Equipped with Procedural understanding Perspective

During the pandemic, schools and colleges adopted the option of online laboratory. Depending on the available resources, the format of online laboratory changed. Some colleges used simulations. Based on these simulations students were asked to perform tasks and collect the data. Some used photographs and videos of experiments. These photographs and videos were generated in the college laboratories and then students were asked to generate data using them. Some colleges sent the low-cost or easy-to-transport apparatus to students along with the instruction sheet. Using these instruction sheets students assembled the apparatus and performed the experiments. Later they were asked to share their data with the faculty and carry out discussions based on their data analysis.

In all these efforts, the rules of the experimental game are clearly laid down for the students. They are informed about the measurement tools to be used. They are given instructions about the procedures to be adopted, the data to be collected and, in some cases, even the range of data to be collected. This hardly leaves any scope to check their knowledge of procedural understanding.

The development of our online laboratory differs exactly at this traditional instruction-driven perspective. We developed webpages with an aim to introduce different aspects of procedural understanding. We wanted to make students think about how to proceed in solving a given experimental problem. We tested our online laboratory experiments through two online camps. The first camp was with 53 student-participants of Indian olympiad program. The second camp was with 56 women students enrolled in post-graduate course in physics.

The students were expected to design their own procedure. The apparatus needed to perform this procedure was to be thought about and obtained by the students. No time limit was imposed on the students. The data collection and the data analysis were to be decided by them. They were given a google form to submit prominent findings and to upload the spreadsheet containing their data and calculations.

Contribution categories - primary focus

University

Contribution categories - type

Application (shared experience, activity suggestions)

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