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E-learning options: a physics perspective

Taking physics lectures online is possible. The main challenge of replacing a blackboard can be solved.

There will need to be some adaption of your teaching style and how you and the tutors interact with students. The following recommendations will produce “good enough” online courses. The aim being that students are engaged and applying the material from the lectures, not simply passively watching videos. The second aim is that this should not significantly increase your workload.

Replacing the Blackboard

From the home office this is difficult/impossible

- Use a tablet with a stylus and record using zoom/panopto. All tablets are different.
- A standard webcam does not have sufficient resolution to record a blackboard/ flip chart (assuming you have one at home)
- Recording a whiteboard doesn’t work (reflections)
- If you typeset your equations you will cover them faster. This might reduce students’ ability to follow.

HS5 as a virtual classroom

We have a set up in HS5 which can capture slides (from any laptop), handwriting (on paper) and video of the lecturer. An example of what this is capable of can be found here:

https://mattertolife.cloud.panopto.eu/Panopto/Pages/Viewer.aspx?id=0bc134d4-d578-4852-8598-ab1e00f89085

The setup is straight forward to use and works with both Zoom and Panopto.

Best Practice Suggestions

- Do less
  - You will not replace your lecture course in this time frame. Focus on the essentials.
  - Online attention spans are typically 20 minutes. There are more distractions and less social pressure. Consider breaking down lectures into shorter sections

  - Make use of external resources to support learning.

- Be clear about expectations
- Create a sense of community
- Be strict about the times you are available for questions
- Practical tips
  - Pre-record the main lecture content. I recommend Panopto or Zoom
  - Make heavy use of the forums on Stud.IP so that the students can ask questions. Students can also add comments to the videos if you use Panopto.
  - Ask your tutors to be present in the forums to reduce your workload.
  - Stud.IP accepts LaTex typesetting for equations (with a few bugs) [tex]…[\tex]
- If the course has tutorial sheets then upload them to Stud.IP.
  - Solutions can be submitted by Stud.IP (a little fiddly but possible).
  - Solutions could be emailed to you or the tutors.
  - Students will probably not have access to scanners so if possible reduce the number of questions which have to be submitted for grading.
  - I suggest providing model solutions to at least some questions but obviously this risks them being available to students in subsequent years.
- If you don't have tutorial sheets (or even you do). Use the "quiz" function on Stud.IP to ask simple conceptual questions (multiple choice) so you can gauge what students understand. Add a free text option here for addition questions.
- Hold a weekly "live" office hours via Zoom (Video Conference) to address open questions.
  - Have a student assistant attend live sessions as a moderator. They can control peoples' cameras/mic's, watch the chat, etc.

Lecture course planned as "Chalk and Talk"

This is more difficult. All the suggestions above still apply.

- Option 1: Typeset your notes as slides and proceed as above. Be aware that it is tempting to increase the speed of delivery of material if you do this. This has consequences.
- Option 2: Use a tablet or other electronic device to handwrite content. You will need to practice, the main constraint is that you have much less space than on a blackboard.
- Option 3: Use the visualiser in HS5

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Lecture course with computational component including linux

Mostly warnings rather than suggestions. Perhaps best discussed on a case by case basis

- Panotpo is not available on Linux. There is a hardware work around but I only own one of them.
- If using Zoom on Linux, it is not possible to share terminal windows via screen share. Your audience sees a black box.
- During the PCL 2 tutorials we were unable to see any of the code or results (graphs) shared by HD in the latter section of the course. (Python and Gromacs)
- There are many ways of making code available. You are more expert than me but I'm happy to discuss.