# City College E-Learning Workshop Notes
# Online replacements for hands-on work

Participants

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|---|---|---|
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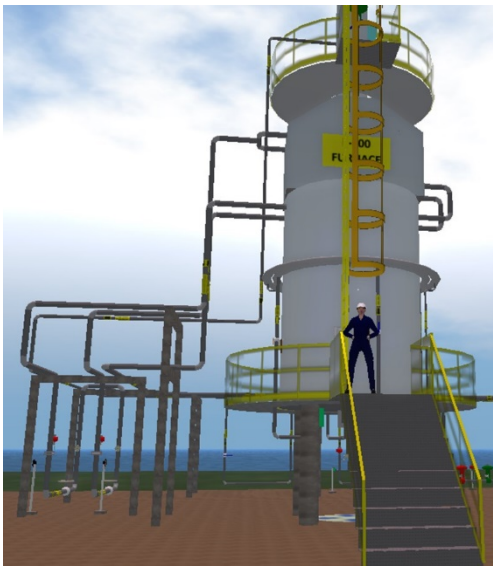
**Workshop Plan**

- Discuss strategies we have used to replace hands-on work in an online environment. Compare our methods. Share some good ideas we can take back and try in our classes.

**Discussion Notes:**

- Depending on the course, there may be online material already built suitable for a lab replacement. The following image shows a virtual chemistry lab where we measured the molecular weight of butane using an authentic experiment.

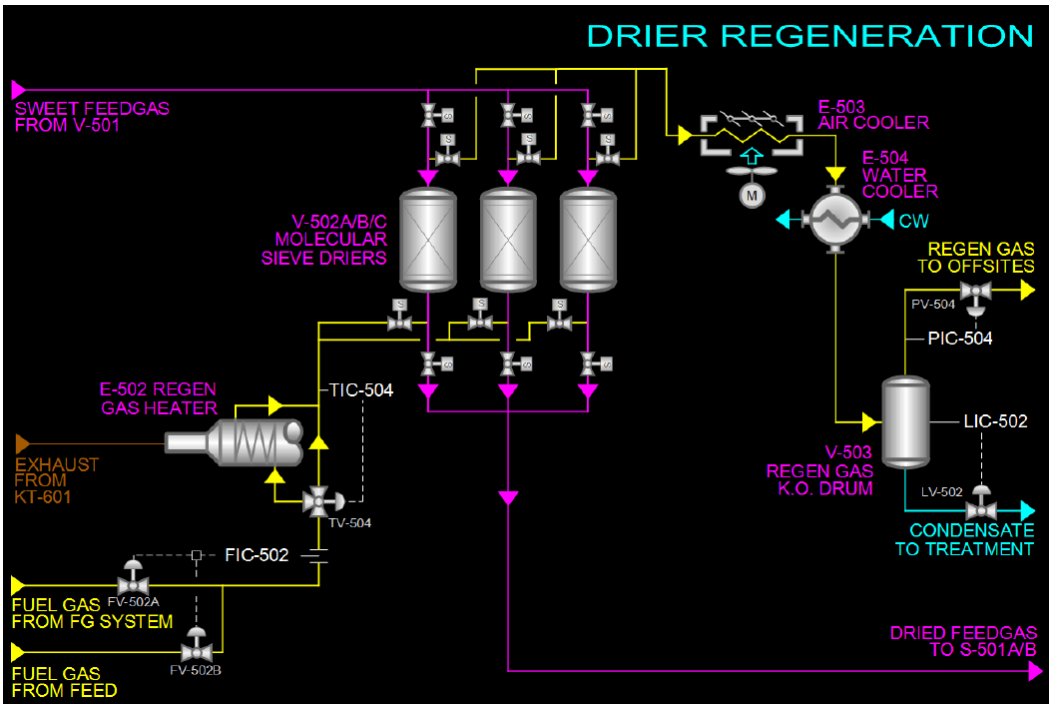

- Building an online experience takes more work but enables the most authentic experience. The following image is an example of an industrial furnace we built that student can startup, shutdown, and use to practice skills responding to abnormal events. There are grant opportunities to build similar tools like the Montana NSF EPSCoR (Established Program to Stimulate Competitive Research).



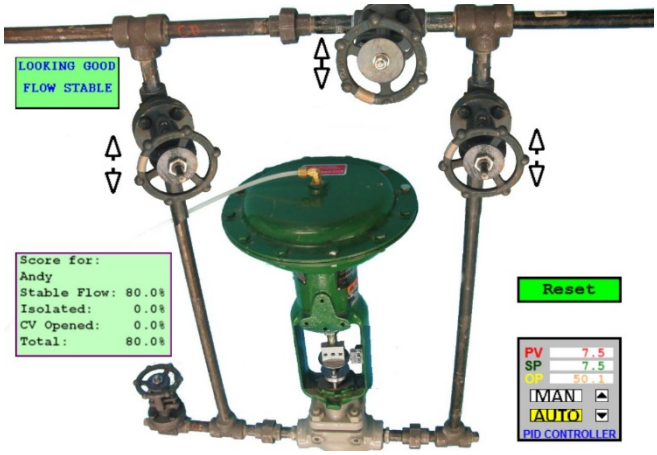
- A great example is one I heard from our Construction Management program. Students researched a topic such as siding a structure using YouTube videos. They critiqued the demonstrations in D2L discussion forums. The

activity proved to be valuable with students learning even from counter examples demonstrating how not to do a job well.

- The IT group's new remote desktop enables students to access specialized software in a remote setting. The following image is a process simulator that PPT students routinely use in labs. IT has added the tool to the new remote desktop software load and students can run the software from home.




- Tools like Game Maker and HTML with JavaScript enable the creation of learning games, serious games, or simulations with a moderate level of training. The following shows a trainer made in Game Maker that allows student to practice and refine skills bypassing a control valve.




- Students used breadboards, components, and volt meters signed out from school to conduct labs at home worked well. The instructor would ask questions like voltage between two points and be able to verify proper construction by comparing results with the instructor's circuit.
- Building a wiring schematic where students complete a circuit with feedback also worked well in the I&E program.
- We discussed ways to move a program online if there is a component of hands-on learning component that can't be moved online. Some colleges have used a bootcamp approach where students complete hands-on work over a month or so during a summer. Internships are another option that some colleges have used.

- CSCI has had good success using Visual Studio Code's new collaboration feature (live share extension) to write code as a team. Everyone sees the same code in the same document. The instructor can monitor progress, comment on student changes, and demonstrate code. It works a little like Google Docs when multiple people update the same document in real time.

**Follow Ups:**

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