INVENTORY ALTERNATIVES FOR PRACTICAL EDUCATION

**Virtual Microscope**
Recreates the look and feel of a microscope in an intuitive, browser-based interface that allows the user to explore pre-captured histology image data. The different tools in the mouse’s cursor allow for zooming, labeling, and other descriptions, providing opportunities for independent study. It is used since 2010 by the Human and Animal Physiology group for more than 800 students per year.
- **Case studies**: Each slide has a number which enables class discussions and assignments.
- **Programs**: Students for real-life practicals.

**LabBuddy**
An-learning tool that supplements traditional lab practical education by helping prepare students before lab work, supporting them while working at the lab, and as well to guide them during the experiment.
- **Functionality**
  - Core tasks of the experiment
  - Enrich lab manual with videos, photos and interactive questions.
  - Booking of tools and lab equipment.

**Labster**
A web-based software system that allows students to carry out engineering experiments by remotely controlling real physical test setups from the laboratory. Students can change parameters, measure signals and view the whole setup from a camera feed while operating it. This provides many advantages over traditional simulator models, making the experience more engaging and tangible for the student.
- **Functionality**
  - Change-rich planning tool for booking different timeslots for the equipment.
  - Interactive pedagogical system that guides the student through the experiment process.

**Remote Labs**
Practising with real optical components and photonic systems is prohibitively expensive for students and not always possible. VPI photonics is a professional software program that allows the designer of optical communication systems, as well as the simulation of photonic components.
- **Use cases**
  - Completes lectures and practicals both in the class or remotely online.
  - Carrying out dedicated assignments or experiments for research purposes.

**Kassim**
An online simulation game that provides simulation into the climate control processes found in greenhouses. Purposefully, built with the most up-to-date info in all recent developments concerning climate control strategy and greenhouse technology.
- **Functionality**
  - Allows students to compete with one another for the highest score based on the class.
  - Players receive feedback for their actions while playing the game.

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**Virtual Reality Labs**
A virtual reality environment where the student dives into a three-dimensional world representing real-life practical scenarios. The student can go through experiences, apply deep knowledge in hands-on practical assignments and analyze data that otherwise could not be possible due to risks for health, high costs in equipment and implantation or lack of time.
- **Use cases**
  - Used recently introduced as a pilot for the course Optical diagnosis.
  - The program created a virtual reality lab for students to practice the otherwise dangerous tasks related to working with laser equipment. VR practitioners allow students to practice on realistic prototypes.

**Acoustic Virtual Reality**
Sound and acoustics are a vital aspect of numerous engineering applications. However, unlike other fields which rely primarily on visual tools, acoustics are mostly taught to students in a purely conceptual way.
- **AVR provides both visual and acoustic VR in 1D for evaluating noise and sound in both indoor and outdoor spaces for educational purposes.**
  - It will also serve as a learning tool for better understanding the meaning of sound in spaces and the consequences of material choice and room geometries.
  - A total of 7 scenarios have been developed.

**PathXL**
A software that makes it possible to examine microscopic slides online. The student can zoom, rotate, change depth, take measurements and even see slides in different colours. The tool also offers an in-game navigation tool where the user is guided through a microscopic preparation and is asked carefully directed questions to provide insights about some of the observations.
- **Use cases**
  - Facilitates teaching and explanation
  - Prepares students for practicals making their time at the lab much more efficient.

**HSP**
An open-source content collaboration plugin compatible with several education management softwares. The tool provides a wide range of content types suited for various needs, particularly in practical education and field trips.
- **Functionality**
  - Creates rich interactive videos allowing users to add questions and pop-up texts. VR 360° videos are also another popular feature used for preparing virtual excursions.
  - Provides branching scenarios and other types of self-paced learning scenarios.

**Virtual Pracitcals**
This pilot project allows students to practice laboratory skills in a safe environment using 3D virtual reality. Participating students will find themselves better prepared for real lab practicals.
- An evaluation of the operational viability of CAD/VR in practical education will be conducted as well as its scientific/educational and didactic functionality in education.

**Dialogue Trainer**
Dialogue Trainer is an online simulator where students can practice their communication skills with a virtual character. This character reacts with both text and emotion based on the dialogue choices the user makes. An example of this can be a bad news conversation in a medical or veterinary consultation.
- **Functionality**
  - Creates a safe environment for students where it doesn’t matter if they make a mistake. This prepares them for real-life situations.
  - 300 different scenarios to choose from.

**PleitVrj**
A virtual environment that gives students the possibility to practice and argument in a virtual courtroom. This allows the student to look around in the Excel VR 9 glasses where on one side you see the judges and on the other side the audience. This gives the participant an unparalleled experience which is very close to reality.
- **Functionality**
  - Other students (audience) can watch the pleading on a big screen and provide feedback.
  - Possibility to reach the audience to contribute to an optimal learning experience.

**EINTHOVEN UNIVERSITY OF TECHNOLOGY**
COMSOL is a software program that enables, engineers, scientists, and researchers to simulate and analyze complex physical systems using Multiphysics modeling. It allows users to create virtual prototypes of devices, processes, and systems, and test their performance under a wide range of conditions.

**Hololearn**
An interactive virtual reality environment, where students can practice communication skills in context with virtual patients. The objective of the game is in trying to achieve the best possible examination and energy score for the patient based on the different patient health records and unique personalities.
- **Use cases**
  - A total of 7 scenarios have been developed.
  - Allows nurse and physiotherapy students to practice these key skills.