

## Hybrid lecture with demonstration of experiments

This guide outlines one way to make experiments visible to both students in the classroom and those present online.

Additional information is marked blue.

### Technical solution for demonstrating experiments

The scenario allows up to four HDMI devices as sources. These sources can be, for example:

- a camera for the experiments demonstrated,
- a computer from which the slide presentation is controlled (called PC1 in the sketch),
- a computer on which the evaluation of the experiments takes place (in the sketch PC2)
- and the visualizer in the lecture hall.

Using the video mixer, the teacher can switch between these sources reliably and conveniently at the touch of a button during the lecture. The signal mixed in this way is displayed in the lecture hall via the lecture hall system and at the same time shown via screen sharing via a laptop (referred to as a PC Zoom meeting in the figure) in Zoom for students who are present online. The zoom release does not need to be changed when changing the source. A picture of the teacher in Zoom is also available for online participants; this is not displayed in the lecture hall

At the “PC Zoom meeting”, another person can also moderate the online participants.

### Device list for independent procurement

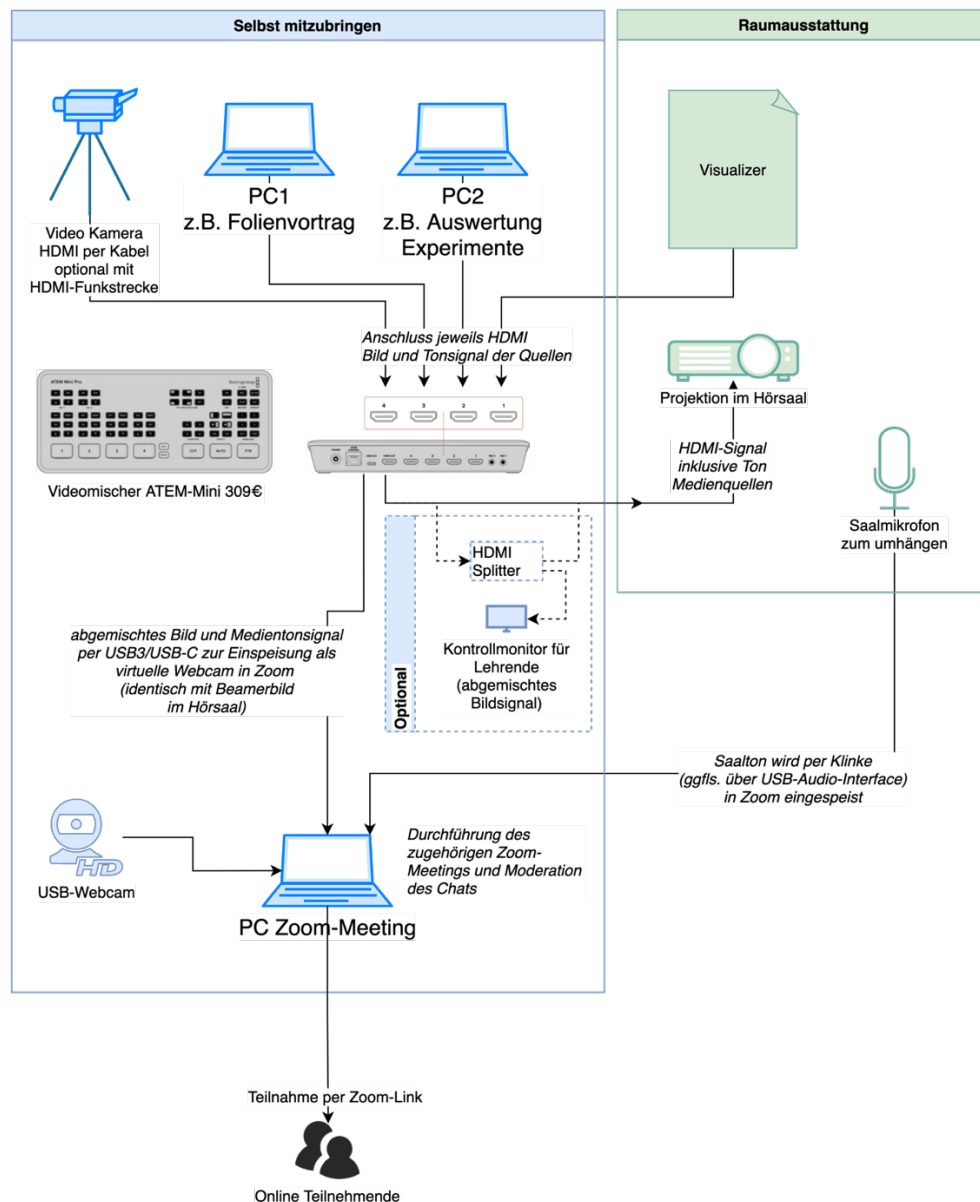
- Device sources, HDMI camera (pay attention to clean HDMI output), laptops etc.
- Video mixer ATEM-Mini approx. 309€
- HDMI cable with sufficient length per source
- HDMI cable for connecting ATEM-Mini to the signal input of the lecture hall system
- USB-C to USB-C or USB 3 cable, connection ATEM-Mini with “Zoom” laptop
- Cable connection to the audio output of the lecture hall with a “Zoom” laptop, if necessary. USB audio card
- USB webcam to display the teacher, with a sufficiently long USB cable (see alternative for optional hardware)
- Tripod for webcam setup

### Optional hardware for independent procurement

- Webcam USB, Obsbot Tiny AI Full HD webcam, approx. €220, camera with 2-axis gimbal and gesture-controlled tracking of the teacher for more freedom of movement

- HDMI radio link, e.g. Swit Curve500 HDMI, approx. €510, for connecting the HDMI camera without tripping hazards and over longer distances, pay attention to DFS (Dynamic Frequency Selection) so that the radio link is approved in Germany. Alternatively, longer HDMI cable
- Control monitor with HDMI input, associated HDMI cable, HDMI splitter (1In,2Out) for mirroring the projector signal

## Sketch of a possible setup



## Next Steps

- You can find out how to record the demonstration of the experiments in Zoom here:  
[https://www.zml.kit.edu/downloads/Kurzanleitung\\_AufzeichnungZoom.pdf](https://www.zml.kit.edu/downloads/Kurzanleitung_AufzeichnungZoom.pdf)
- You can read about options for editing the recording here:  
<https://www.zml.kit.edu/downloads/Videos%20schneiden%20mit%20LosslesCut-Anleitung.pdf>
- Instructions for uploading and making available in ILIAS are available here:  
[https://www.zml.kit.edu/downloads/2021\\_ILIAS\\_Materialien\\_hochladen.pdf](https://www.zml.kit.edu/downloads/2021_ILIAS_Materialien_hochladen.pdf)

## Infos & contact

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