**Suggestions for the use of digital media in teaching**

The possibilities and technical requirements for digital teaching certainly vary in the different forms of courses such as one-to-one lessons, seminars/group lessons or lectures. Some general scenarios that range from simple to complex applications are outlined below:

1. A quick and uncomplicated solution is to exchange video/audio recordings of one’s own music or exercises and solutions in the form of pdf files for theoretical academic lectures by e-mail between teachers and students. Comments, feedback, etc. can be given by telephone, e-mail or other digital means of communication.

2. A more convenient solution for the creation and exchange of learning material is a so-called learning management system (LMS). HfM Detmold offers the platform detmoldmusic.tools.de for this purpose. This short film provides an overview of its functions: [https://youtu.be/XYbiggBEt-8](https://youtu.be/XYbiggBEt-8).

3. For one-to-one lessons as well as seminars and lectures, you can also use a video conferencing system. The program to be used throughout the university is zoom.us, which permits acceptable audio transmission. This software, for example, also allows other participants to view your screen and the documents displayed on it.

4. The free version can be used for an unlimited period of time by up to two people and is hence ideal for one-to-one lessons. Teachers are asked to install the free version directly from the website. For groups of three or more participants, a paid version must be used. The university will therefore purchase licenses and make them available to the respective teachers. Here you can get an impression of the software: [https://www.youtube.com/watch?v=LiS53OtEvn8](https://www.youtube.com/watch?v=LiS53OtEvn8).

On Mac computers, you can go to -> Settings -> Audio -> Advanced settings in the zoom application and deactivate the noise cancellation. If there are problems with the transmission or quality, you may find the following information helpful for optimisation.

**General requirements for using video conferencing systems:**

All common desktop and notebook systems that are not older than five years are probably suitable.

- The systems should have at least a dual core CPU – Intel Core i3, but preferably Core i5 – and a clock speed of at least 2 GHz.
- The recommended size of the main memory (RAM) is at least 4 GB, with 8 GB certainly being the preferable configuration.
- With respect to the browser, the common programs can also be used (make sure you use the latest version of the browser):
  - Internet Explorer (for security reasons, please use IE 11),
  - Chrome
  - or Safari.

**Internet bandwidth:**

- The more is not necessarily the better, but you should have a reliable connection with at least 5 Mbit.
- The current tariffs offering 16, 50 or 100 Mbit are certainly more promising, because the upload rate, which is often only ¼ of the booked bandwidth in case of private internet connections, is important for the transmission of music.
• If problems occur, you can test your connection at: https://www.speedtest.net. The upload speed should be at least 1-2 Mbit/s.
• The specific system requirements for using the zoom program can be found at: https://support.zoom.us/hc/en-us/articles/201362023-System-Requirements-for-PC-Mac-and-Linux.

In addition to the general requirements, here a few tips to avoid problems:
• Close all other programs on your computer. Make sure that you have no other tabs open in your browser. Make sure that no one else establishes an Internet connection that uses a lot of data (video streaming, etc.) within your (home) network at the same time.
• If in doubt, restart your device (laptops are, for example, often only closed for long periods of time, so that large amounts of unnecessary temporary data accumulate in the dynamic memory).
• If problems occur, test several browsers.

Cameras and microphones:
In principle, the camera and microphone built into laptops can be used to transmit images and sound via the zoom program. However, these are almost always of limited quality and only directed to the user, so that it makes sense to connect external devices via USB for teaching purposes. It is recommended to use headphones or a headset instead of the built-in speakers for video conferences.

A camera resolution of 1600x1200 or 1920x1080 (HD) is recommended in order to see details on the screen. Mono microphones are usually sufficient; some webcams also have stereo microphones. There are closed headsets, which embrace the ear and reduce ambient noise, and semi-open headsets, which allow more to be heard from the outside and are often more comfortable to wear. If live music is also to be transmitted, you have to make sure that the noise cancellation and/or speech optimisation is deactivated in the conference software and/or driver of the microphone. Using an external microphone can significantly improve the music quality. It is important to select and configure the devices to be used before using the conference software.

The following devices indicated in increasing quality/price are, for example, suitable (approximate current online prices):

Webcams with microphone:
- Logitech QuickCam Pro for Notebooks (€40)
- Logitech HD Pro C920 (€70)
- Logitech ConferenceCam Connect (€320)

Headsets:
- LogiLink HS0033 (€12)
- Logitech G432 (€50)
- Sennheiser SC 260 MS II (€100)
- Sennheiser GSP 350 (€100)

External microphones:
- Marantz Pod Pack 1 (€51)
- SPC Gear SM900 Streaming USB Microphone (€80)
- Shure Motiv MV5 (€110)
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