

*How to Do:*

## Camera - Technician Tutorial

Quick Reference:

A moving image during a meeting or lecture allows a change to the voice and slides and adds a more personal component to a presentation. However, incorrect positioning or lighting can be distracting, while better image quality can lead to a more professional impression. The following sections discuss positioning and lighting, as well as additional camera options. There is also information on the different methods of connecting and setting up an external camera.

### Specific help: Positioning/ Light:

Built-in cameras in laptops, as well as external webcams, are usually at the top of the screen. The problem here is that laptops are usually compact or the table height is low, which leads to recording from below. The angle is unfavorable, it leads among other things to the fact that the eyes are half closed when looking at the screen. A simple trick here is to place the laptop in an elevated position.

You should make sure that the camera is somewhat at eye level. There are third-party "laptop stands" for this, although a stack of books is also sufficient.

### Positioning the camera / exposure - What to look for:

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| 1. | Camera at eye level  |
| 2. | Position in the center of the image so that the main focus is on you                               |
| 3. | Check background, possibly remove private objects and/ or work with background filter of e.g. Zoom |

The quality of cameras varies greatly and depends on many factors. One of the most important factors is the lighting conditions during shooting. Good lighting can even improve the image quality of a "poor" camera.

Care should be taken to ensure that light is not shining directly on the camera (for example, if the light source is positioned behind you, especially also if sitting with your back in front of a window). Otherwise, this will result in you being silhouetted against a radiant background, and every time you move, the camera's automatic exposure settings will have to be readjusted. Ultimately, this results in a distracting, persistent change in image brightness.

Sunlight is the best light source because it is a natural light source that illuminates you at a constant temperature. If you position yourself so that there is a window in front of or to the side

of you, then you will be well lit. If there is a window in front of you, you will be completely illuminated, the position of the sun will also cause shadows to form, which will keep you from looking "flat". If you are sitting to the side of the window, the lighting will look a bit more "dramatic" as half of your face will be illuminated while another half will be in shadow. You could contrast this with a table lamp.

One disadvantage of sunlight is that this lighting is weather dependent. Therefore, it is advisable to have external light sources available. A good light source could be a table lamp, these should shine on the wall behind the camera or directly on you. If you use multiple light sources, make sure that the bulbs have the same color temperature. If you mix white light with red light, you will confuse the light balance or color correction settings of your camera, which may cause the colors to be falsified. Additionally, it is recommended to light the room you are sitting in well (e.g. with ceiling light) so that a lot of light hits the camera.

#### Lighting - What to look out for:

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| 1. | Light source should be in front of or next to you (not from behind, shining into the camera), this applies to sunlight (window) or other light sources |
| 2. | Well illuminate the room in which you sit. It should be generally bright   |

#### [Specific help: Built-in webcams \(laptops\):](#)

Built-in webcams are the cheapest option, as they do not require any additional external devices. The quality of a built-in webcam varies greatly from computer to computer and can be poorly estimated. The cameras are relatively small, which means that they do not have the best lenses or sensors. Therefore, they are relatively sensitive to lighting. Too little light can result in image noise, while too much light can result in a blinding, unrecognizable image. In addition to that, the adjustment possibilities of such cameras are very limited. Therefore, only lighting and positioning can improve the image quality.

#### [Specific help: Installation and setup of external webcams:](#)

External webcams are great for easy and quick image quality enhancement. The setup is usually as simple as "plug & play" via USB and come with additional software that allows further settings of the image. Again, prices are very variable and can range from 20Euro to 80Euro. In the price are included image quality, construction (with adjustable leg), additional features (such as built-in light/microphone) and firmware support.

The biggest advantage of external webcams is that they are easy to install, set up and use. When such a camera is connected to the computer, it is automatically selected as the default device. Attention. When connecting the camera, make sure that you connect it to a USB3.0 port. Otherwise you may have problems with the image transfer. In addition, you can easily change the camera source during a zoom meeting, which gives you the opportunity to give a different angle of view.

#### [Specific help: Connecting and setting up mirrorless/mirror reflex/camcorder cameras via capture cards:](#)

The last way to improve the image would be via an external camera that is not a webcam. The setup is the most complex and requires the most effort, but gives the best results, as these cameras have much better lenses, sensors and processors. To check if a camera can even be connected to a computer, you need to see that the camera has an HDMI out. This can be in the form of standard HDMI, mini-HDMI or micro-HDMI. Only through such a port can the camera

transmit a clean HDMI signal, which means that the camera only transmits the image and no other information.

To use such cameras, you need at least 2 additional devices:

1. A capture card: these cards transfer the HDMI image from the camera to USB so that the computer can receive the image as "input". Such capture cards vary in price. Two different ones are presented below:
  - a. Elgato 4K Camlink: This card transmits signals up to 4K. For live streaming this is not necessary, because in most cases the transmission of Zoom (or other live streaming services) is downscaled to 1080p. This card costs 120€.
  - b. HD Video Capture: This card can transmit signals up to 1080p. This card is a cheap "no-name" brand and works almost as well as the Elgato variant for livestreaming. Except for the quality cap, this card has fewer settings as it has no additional software. This kind of card costs between 12-30€. Attention. When buying such cards, make sure that you buy a card with USB3.0, as USB2.0 is usually too slow for video transmission.
2. An HDMI cable, which transfers the signal from the camera to the capture card. Thus, your camera is now a webcam. Attention. The HDMI cable must have one connector as standard HDMI (for the capture card) and one connector with the corresponding HDMI-out for your camera.
3. Lastly, you will most likely also need some kind of tripod on which to place the camera.

If you have all of the above devices, you can start the setup. To do this, plug the HDMI cable into the camera and capture card and connect them to the computer. Attention. Check that your capture card is connected to a USB3.0 connector (usually colored blue), otherwise you may have problems transferring the image. The capture card will be recognized as "External camera device" and selected by the computer as default device. The last thing to check is that the camera does not turn off by itself. To do this, perform the following steps:

- Go to the system settings of the camera and deactivate the automatic switch-off. (Can also be called under "Eco-Mode")
- Provide a permanent power supply. Connect the camera to the charger. Attention. Some cameras can not be charged during use, in such a case you need a dummy battery, which is plugged into the camera and connected directly to the charger.

Advantages this method:

- Best image quality.
- Optical zoom for objects that are further away from the camera.
- Can be used as a second camera to show other angles of view.
- Some cameras have a screen so it feels more natural to look into the camera.
- If you already have a camera at home, maybe this can be used.

Disadvantages this method:

- Chargeable
- Many additional items needed
- Complicated setup

## Specific help: Zoom settings

Zoom has the function to detect all connected input and output devices and gives you the possibility to select them independently from default settings. To change the input and output devices via Zoom:

- Click on the cogwheel to open in the settings
- Click on "Video"
- Select the desired camera under "Camera"

Under Zoom's video settings, you can also set up the camera's quality. You can change the ratio, allow HD video sharing and even improve the image by means of retouching and adjusting to low light.

You can play with the different settings until you have the best possible image. Attention. The zoom settings only work at zoom and not globally.