

How to Do:

Microphone - Technician tutorial

Brief overview:

One of the most important components of an online event is the sound quality. Low sound quality can make you slurred, too loud, or too quiet, for example, and can be extremely uncomfortable for the audience. All of these can reduce the listener's learning experience and attention span. Improving sound quality depends on the type of device - specific tips for improvement are provided below.

To do this, it is recommended to use Zoom to test how the listener hears you. Zoom provides various settings for this purpose, as well as the option to make test recordings.

Specific help: Built-in microphones:

Built-in microphones are the cheapest option, as they do not require any additional external devices. The quality of a built-in microphone varies greatly from computer to computer and can hardly be estimated across the board.

Basically, the microphones are relatively small and made for listening at a distance of about 20-30cm. Therefore, they are sensitive, which can lead to background noise and the clicking of mouse and keyboard being heard.

Ways to improve sound quality by avoiding background noise:

1. Sitting in a relatively small, non-empty room.
Why?
 - Large rooms reverberate more
 - Furniture can catch sound and thus dampen it
2. Place a blanket under the laptop so that reverberating sound is intercepted.
Caution!
 - A blanket can cover the fans of some laptops and cause overheating, so this method is not recommended on hot days or for very long sessions

Specific help: connecting and setting up headsets

Headsets are a combination of headphones and microphone and can cost between 15-100 euros. The price includes both audio quality of the headphones and microphone, and comfort. The biggest advantage of headset microphones is the proximity of the microphone to the mouth. This means that they do not have to be as sensitive, which leads to a strong attenuation of background noise and sounds. The attenuation of the audio is provided by the low gain of the microphone, which can lead to a slight "nasal" voice. To do this, you should make sure that the microphone is not too close to the mouth, as plosives (consonants whose articulation blocks the

flow of breath; the sound is thus produced by a small "explosion") and breathing are picked up despite the lower gain. This results in an unpleasant sound for the listener. More about this in the Test Recordings section.

Connecting headsets varies from product to product.

There are classically 3 different types, which are presented below:

Analog	Two 3.5mm jacks, each to be plugged into the correct port <ul style="list-style-type: none">- Green: Audio-In (from the computer into the headphones)- Red Audio-Out (from the microphone into the computer). Notes: <ul style="list-style-type: none">- Most laptops only have one 3.5mm jack port for In and Out together, so either an adapter must be purchased or a headset with a 3.5mm jack with 3 bands (most cell phone headsets with a mic) must be purchased - Analog headsets are usually cheaper because they don't have an internal "Digital to Analog Converter" (DAC for short). The DAC transfers the digital audio into analog audio and vice versa, this task is done by the sound card of the laptop. However, if the sound card is of low quality or the computer is a bit older, it can lead to humming or hissing. Even a "better" analog headset without DAC will not help here!
Digital	Connection via <ul style="list-style-type: none">- USB- Bluetooth Attention! Not all desktop computers have built-in Bluetooth receivers. If you do not see a Bluetooth signal in the taskbar, there is a possibility to buy a separate universal USB Bluetooth receiver. After connecting, you still need to select the device: <ul style="list-style-type: none">- right click on the speaker icon in the taskbar- Click on "Open sound settings"- Select the device under "Output" to listen to audio from your computer through the headphones of the headset- Select the device under "Input" to use the microphone of your headset- With these steps the headset is the default device, this only needs to be done once as long as the device is connected Notice: <ul style="list-style-type: none">- Both USB and Bluetooth headsets have internal DACs, resulting in slightly improved sound quality

Specific help: [Connecting and setting up a USB microphone](#)

USB microphones have the best recording quality and can be adjusted the best, but are the most expensive option. Prices range from 30-150 euros. In the price are calculated recording quality, construction and adjustment options. USB microphones are sensitive and made for listening at a distance of about 15-30 cm. Due to their size, it is also possible to set them up for longer distances without losing too much sound quality.

Most USB microphones come with an Art-Pop protection filter, which can attenuate plosives and small background noises. The slightly more expensive microphones have a 3.5mm jack-in,



which allows you to connect your headphones to hear sound from the PC as well as listen to yourself without delay. In addition, such microphones also have a volume control that can regulate both level and volume, as well as mute everything. This also makes it much easier to adjust the device during a recording, as you don't have to go into the system settings to do so.

Due to their sensitivity, background noise can be heard, as well as ringtones, clicking of the mouse and keyboard.

Some ways to suppress these sounds are:

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| 1. | Sitting in a relatively small, non-empty room.
Why?
- Large rooms reverberate more
- Furniture can catch sound and thus dampen it |
| 2. | Place a blanket under the microphone so that the reverberating sound or vibrations are absorbed. |
| 3. | Mount the microphone on a boom arm so that no vibrations from the table are picked up by the microphone |

Specific help: test recording & changing the microphone volume level

To check the volume of the audio, you can record yourself using Windows' pre-installed voice recorder.

Open the Windows voice recorder to make test recordings:

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| 1. | Press the Windows button, or click the Windows icon in the lower left corner. |
| 2. | Type "Voice Recorder" in the search bar and open the program. |
| 3. | Allow access to the microphone |
| 4. | A test exposure can be started |

For a meaningful test recording, you should use a sentence with many plosives, as these are usually picked up strongly by the microphone and are unpleasant to hear at too high volumes. An example sentence would be, "Peter is wearing small blue shoes to the test. He likes these very much."

The basic settings of the microphone are set automatically (usually to 50%) by the operating system. Changing the settings can lead to a rapid improvement in quality.

Change the sensitivity of the microphone:

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| 1. | Click with the right mouse button on the speaker in the taskbar |
| 2. | "Select "Open sound setting |
| 3. | Click on "Sound control panel" |
| 4. | Click on "Capture" tab |
| 5. | Search for the desired microphone and right-click to select it |
| 6. | Click on "Settings" |
| 7. | Click on "Level" tab |
| 8. | Set volume up or down |

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.

Change input and output device via zoom:

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| 1. | Click on the cogwheel to get into the settings |
| 2. | Click on "Audio" |
| 3. | Selects desired loudspeaker under "Loudspeaker" |
| 4. | Selects desired microphone under "Microphone" |

Under Zoom's audio settings, you can also adjust the volume of the microphone and make a test recording via Zoom until you achieve the optimal sound. Caution. The Zoom settings work only on Zoom and not globally.