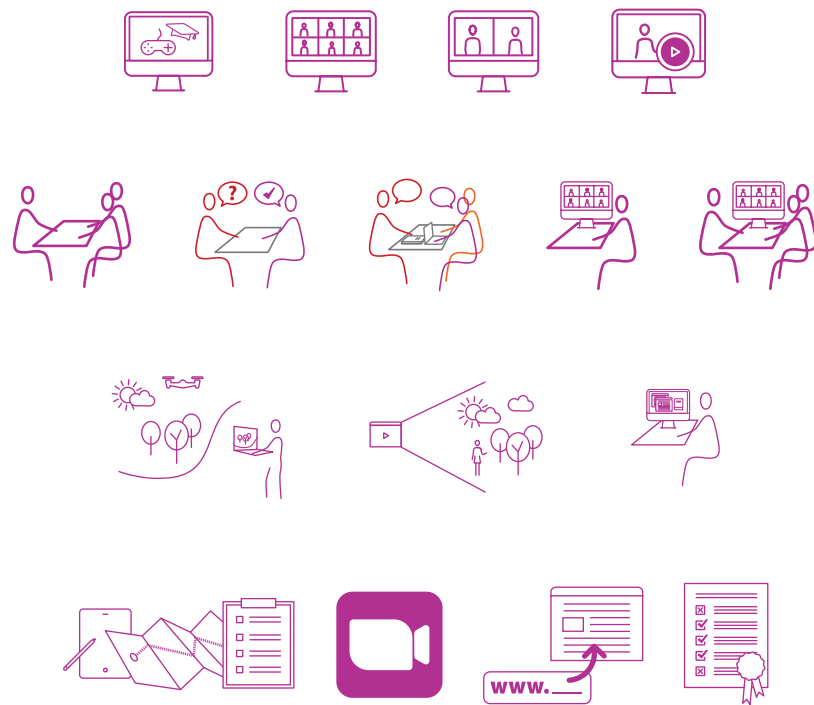


Technical Equipment for Hybrid Teaching at Faculty 12

Guideline created under



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Institute for Technology and
Resources Management in
the tropics and Subtropics

Faculty 12
Faculty of Spatial
Development and
Infrastructure Systems

Technology
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TH Köln



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Introduction

In hybrid teaching, consideration of potential (new) learning scenarios, good knowledge of the equipment (e.g., cameras, microphones) installed in your classroom as well as potential ways of interaction are definitely important to successfully deliver your classes to both physical / in-room and digital / online audience.

In this guide, you will find examples of hybrid learning scenarios, and indications for the technical preparation of the classrooms used by lecturers of the Institute for Technology and Resources Management in the Tropics and Subtropics (ITT, Faculty 12, TH Köln). In addition, information on available mobile equipment that can be borrowed for hybrid teaching in other rooms is provided. It is important to note that this guide is based on the concepts already presented in the article Fallstudien - EZ Hybride Lehrräume of the Zentrum für Lehrentwicklung (ZLE) in July 2021:

„Hybrid teaching spaces consist of a combination of different dimensions such as physical space (presence formats), digital space (online formats), social space (interactions) and didactic space (teaching development). The individual dimensions complement each other and overlap. In contrast to blended learning, communication between the present learners and teachers in the physical space takes place synchronously and seamlessly with connected participants in the digital space. With the help of the didactic space, physical and digital teaching spaces can be designed consciously and appropriately on the basis of basic didactic concepts for various hybrid teaching formats. [...]“ (EZ, 2021) (comp. Figure 1)

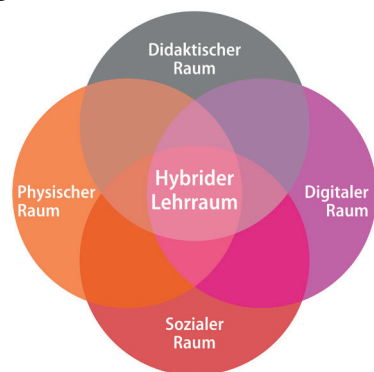


Figure 1: The four dimensions of a hybrid teaching space (EZ, 2021)

Hybrid Learning Scenarios at Faculty 12

The definitions of hybrid education are numerous, as well as the different scenarios. Therefore, only the four most common learning scenarios are presented in the first part of the guide:

1. Frontal hybrid lecture (lecturer in class)
2. Frontal hybrid lecture (ITT lecturer or external lecturer online)
3. Hybrid group discussion or meeting and
4. Hybrid small group work.

Technical equipment for hybrid teaching

The second part of the guide contains technical indications for the set-up and implementation of hybrid classes in one of the classrooms ZO-4-6/7/8, ZS-7-10 and ZN-4-5 at Cologne Deutz. For your orientation, for each classroom the room plan, the equipment installed, necessary connections, and the installation steps are presented.

It is important to point out that the still existing technical complexity is due to the fact that the equipment is upgraded and adjusted to the users' needs step-by-step to increase the technical quality of the hybrid classes.

Mobile equipment for hybrid teaching

The third part of the guide shows you the mobile equipment available in the faculty so that you can teach your hybrid classes in another classroom or in your own office. This equipment is currently available for loan in the technical administration office of the faculty.

Source: EZ, 2021. Hybride Lehrräume Fallstudien – Kurzfristig umsetzbare medientechnische Lösungen für die hybride Lehre; <https://th-koeln.sciebo.de/s/c4rNBaebOxqQNY2>

Indications / recommendations

1. Communicate set-up of class with students and tutors in advance

Inform your students well in advance how you will organize the class, what digital tools will be used including the link to access and what devices do the students need. Distribute the same study material to both physical and virtual students.

2. Keep in mind the legal framework for digital teaching

Before the start of the lesson, you should inform your students that data processing will be done by video and/or audio participation and that this participation is voluntary for the students. Obtain the consent of the students.

If the physical students in your course do not want to be recorded, make sure to set up your technical equipment (camera and microphone) so that certain areas of the room are „camera- and sound-free“. In the case of online students, if students participating online turn on their cameras, they automatically give their consent to the data processing.



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3. Handle on-site and online technology properly

If possible, try out the equipment (e.g. camera positions and follow-me function) and communication tool (e.g., Zoom and 2nd display) for your class, and familiarize your-self with it. Allow sufficient time for the preparation, set-up and dismantling of each session. This takes time – if you are trained 10 mins. The main set-up (left side in the step-by-step description) without consideration of a better community feeling (right side) takes less time.

At the beginning of your event, again explain transparently to all participants which image and sound transmissions will take place. If you want to record the event, consult the participants beforehand. In the guide, all equipment is indicated with a QR-Code. This code gives you access to the instructions and technical manuals of the equipment in case you need them (you need to login to Ilias and enter the course, to be able to access information). A short explanatory video about the set-up of the technical equipment, you can find via the following QR-code:

QR-Code

In the rooms, the connections are color-coded. The description of the connections in this guideline follows the same color-coding. (Cables are colored in illustrations)

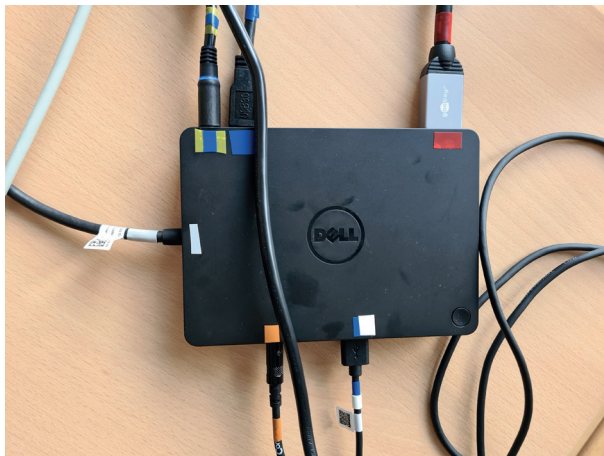


Figure 2: Example of color codes for understanding of connections

4. Get access to technical equipment (secured)

Within the technical considerations, some security measures have been taken to protect the equipment. You are already aware of the existence of codes and keys for access to the technical equipment in the different classrooms. If this is not the case, please do not hesitate to contact us.

ZO-4-6/7/8

For access to the microphones and cameras, in the trolley rack a key is required. The key is in the possession of the lecturers, as well as in the secretariat and in the classroom itself. In the classroom, the key is located in a safe. You can access it with the code we have already given you. Please, do not forget to put the key back in the safe at the end of your lesson.



Figure 3: Key lock in ZO-4-6/7/8 (opens with the same code as suitcases and contains key to trolley rack)

ZS-7-10 and ZN-4-5

The microphones and cameras are located inside a safety suitcase. To open the safety case, always use the same code that was given to you. Please do not forget to put the equipment back again and make sure that the case is locked when leaving the classroom!



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In case of technical problems that are not covered in this guide, please contact:

Campus IT - Service Desk
+49 221-8275-2323
support@campus-it.th-koeln.de

Hybrid learning scenarios at Faculty 12

Scenario 1.1: Frontal hybrid lecture (lecturer in class)

Best room: ZO-4-6/7/8

Potential rooms: ZS-7-10 and ZN-4-5
(but without extra screen)

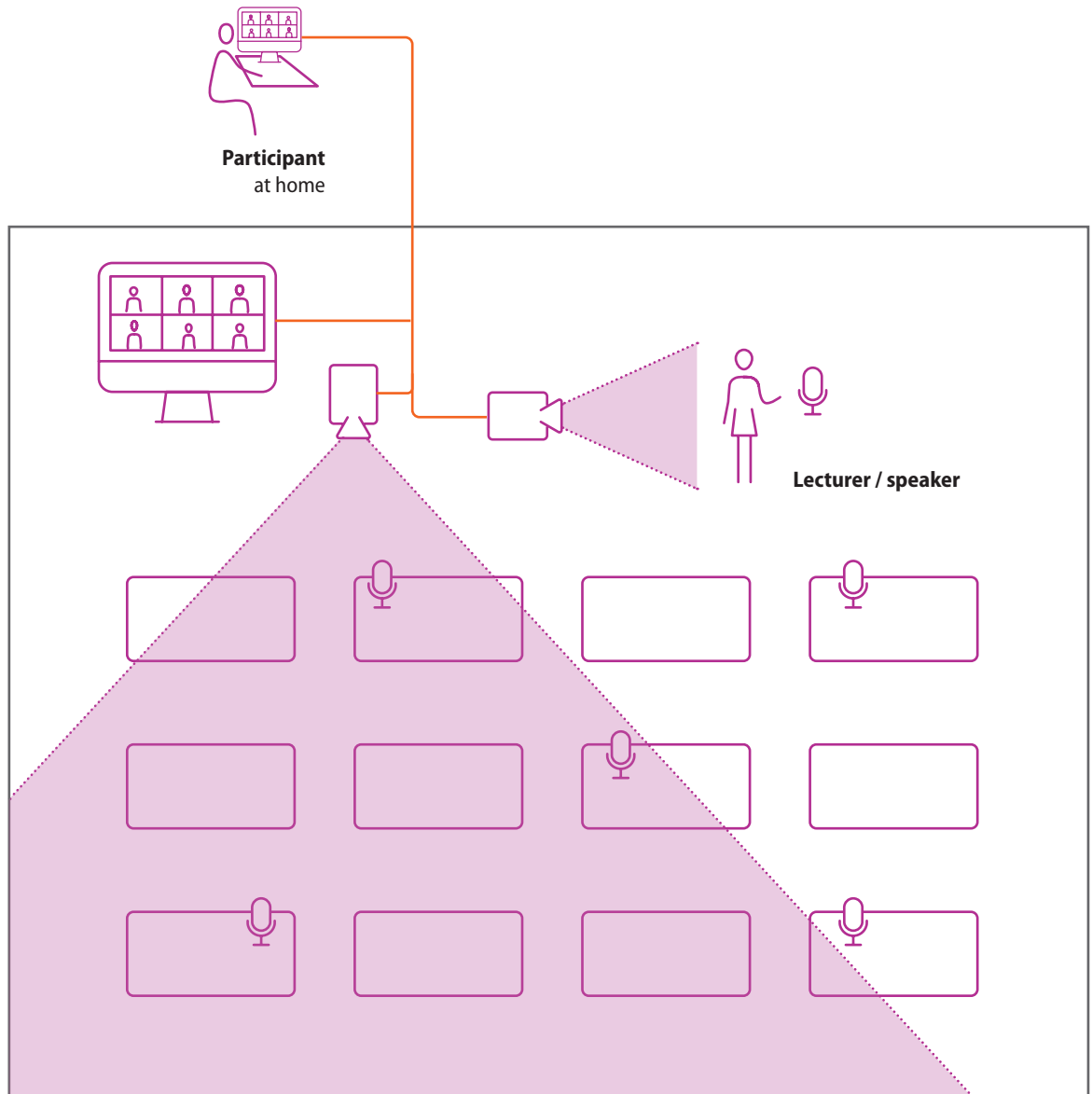
Online participants displayed via an extra screen and gallery mode

Tablesetting front view rows

camera view

Adjustment of audience camera according to participants agreement to be recorded

Classroom



Number of online participants is limited by max. number of participants allowed in zoom and in-room participants by room size, number of coupled mics and loudspeaker.



Use Case: Basis knowledge teaching

- » Presentation of knowledge (e.g. definitions)
- » Explanation of knowlegde

Tipp: It helps to have one tutor supervising the chat and another one who supports the technical set-up in class

Alternatives: Asynchronous learning / self-study for basis knowledge teaching



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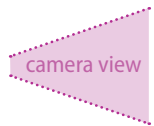
Hybrid learning scenarios at Faculty 12

Scenario 1.2: Frontal hybrid lecture
(ITT lecturer or external lecturer online)

Best room: ZO-4-6/7/8
Potential rooms: ZS-7-10 and ZN-4-5
(but without extra screen)

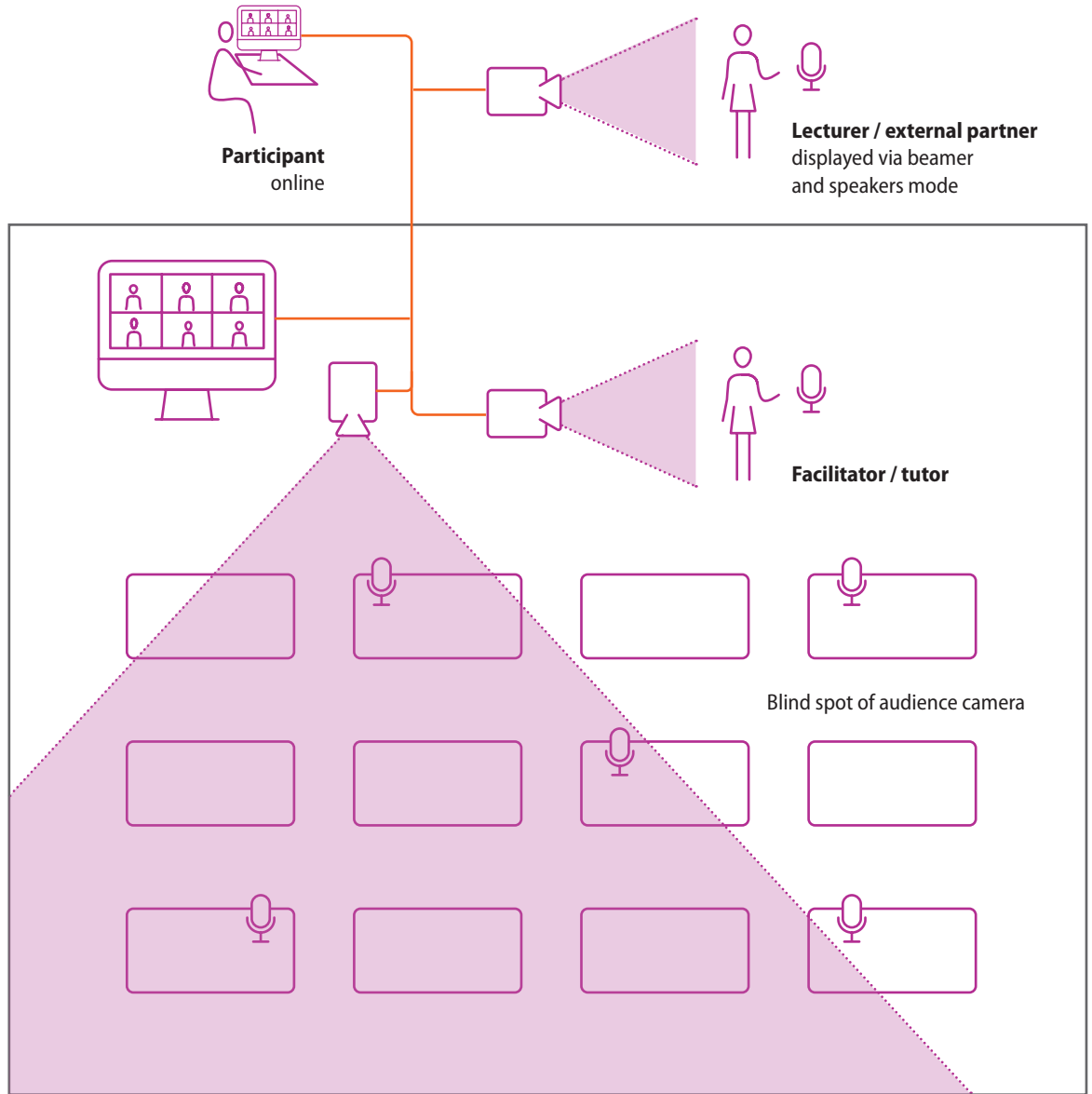
Online participants displayed via an extra screen and gallery mode

Tablesetting front view rows



Adjustment of audience camera according to participants agreement to be recorded

Classroom



Number of online participants is limited by max. number of participants allowed in zoom and in-room participants by room size, number of coupled mics and loudspeaker.



- Use Case: Basis knowledge teaching
- » Presentation of knowledge (e.g. definitions)
 - » Explanation of knowlegde
 - » Integration of external partners into your lecture
 - » While traveling for work holding your lecture with onsite insights

Tipp: It is necessary to have one tutor/lecturer in room to manage technical set-up.



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Hybrid learning scenarios at Faculty 12

Scenario 2: Hybrid group discussion or meeting

Best room: ZO-4-6/7/8

Potential rooms: ZS-7-10 and ZN-4-5
(but without extra screen)

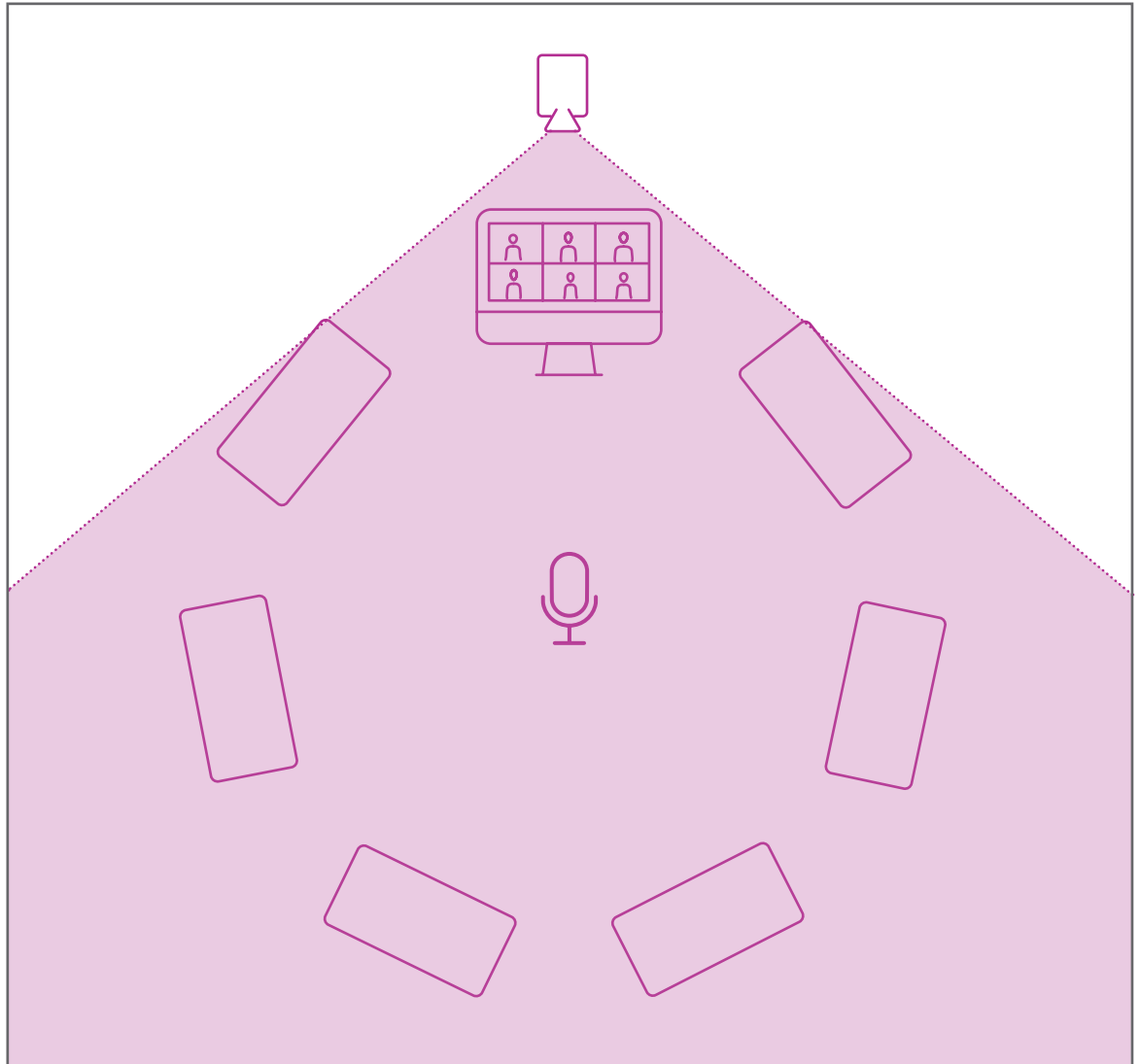
Online participants
displayed via an
extra screen
and gallery mode

Tablesetting
circle

camera view

Everyone agrees
to be recorded
via camera.

Classroom



Number of online and in-room participants should be limited to a group size that allows discussions and exchange of ideas.
E.g. 5-10 in-room participants and 5 online participants



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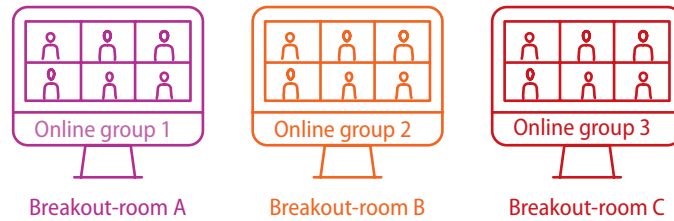
Use Case: Complex teaching
» Discussion of learned knowledge
» Exchange ideas

Tipp: Make sure everyone is heard by the micro in the center.

Hybrid learning scenarios at Faculty 12

Scenario 3: Hybrid small group work

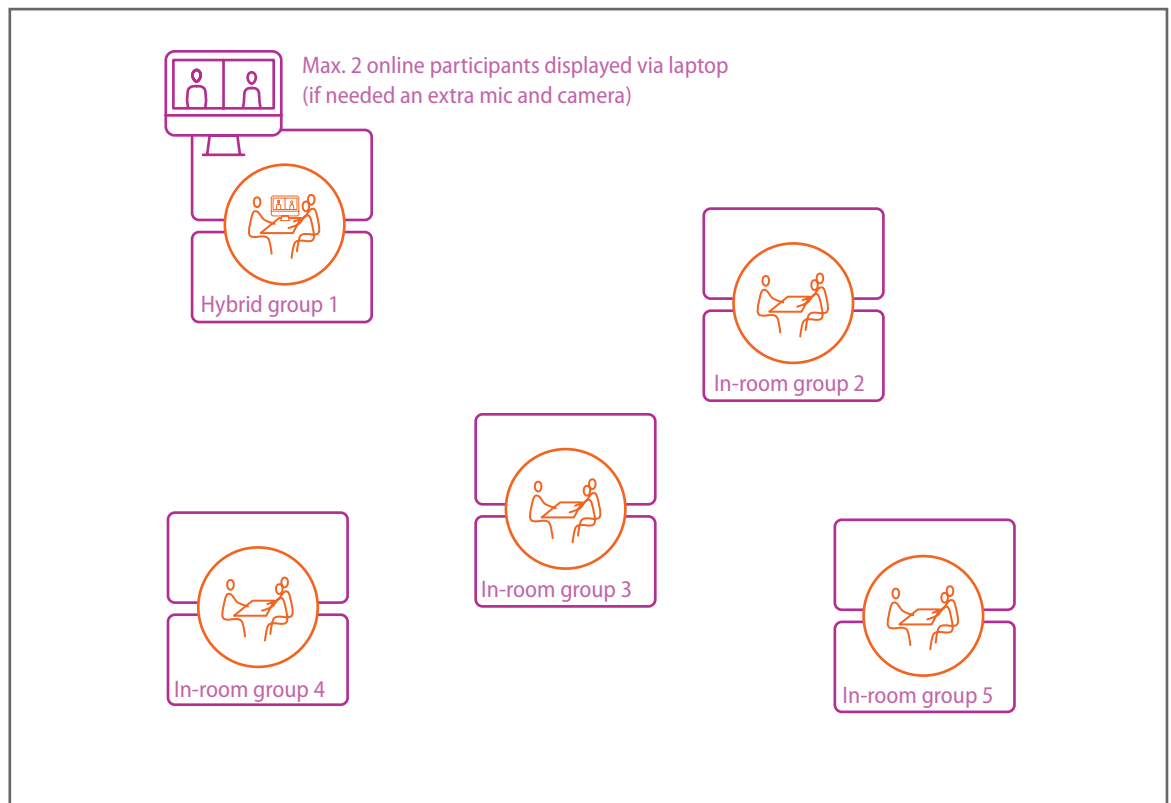
Room does not matter.



Online participants only connected virtually via breakout-rooms.

Online participants in hybrid group are displayed via laptops

Tablesetting workshop
Group size 5-7 participants



Classroom

Number of online participants is limited by max. number of participants allowed in zoom.
In-room participants are limited by size of room.
Group size should be around 5-7.



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Use Case: Complex teaching


- » Discussion of learned knowledge
- » Exchange ideas
- » Analyzation of learned knowledge
- » Conceptualization and development of ideas



» ! Tipp: Make sure to make rather pure online and pure offline groups instead of hybrid groups. If you can not avoid it, make one mixed group so that the effort needed to technically support this group is limited.



Tipp: One online tutor should be juming between breakout-rooms to support online groups.



Technical equipment in Room ZO-4-6/7/8




Room plan

- I**  **Computer installed**
with connections via USB HUB

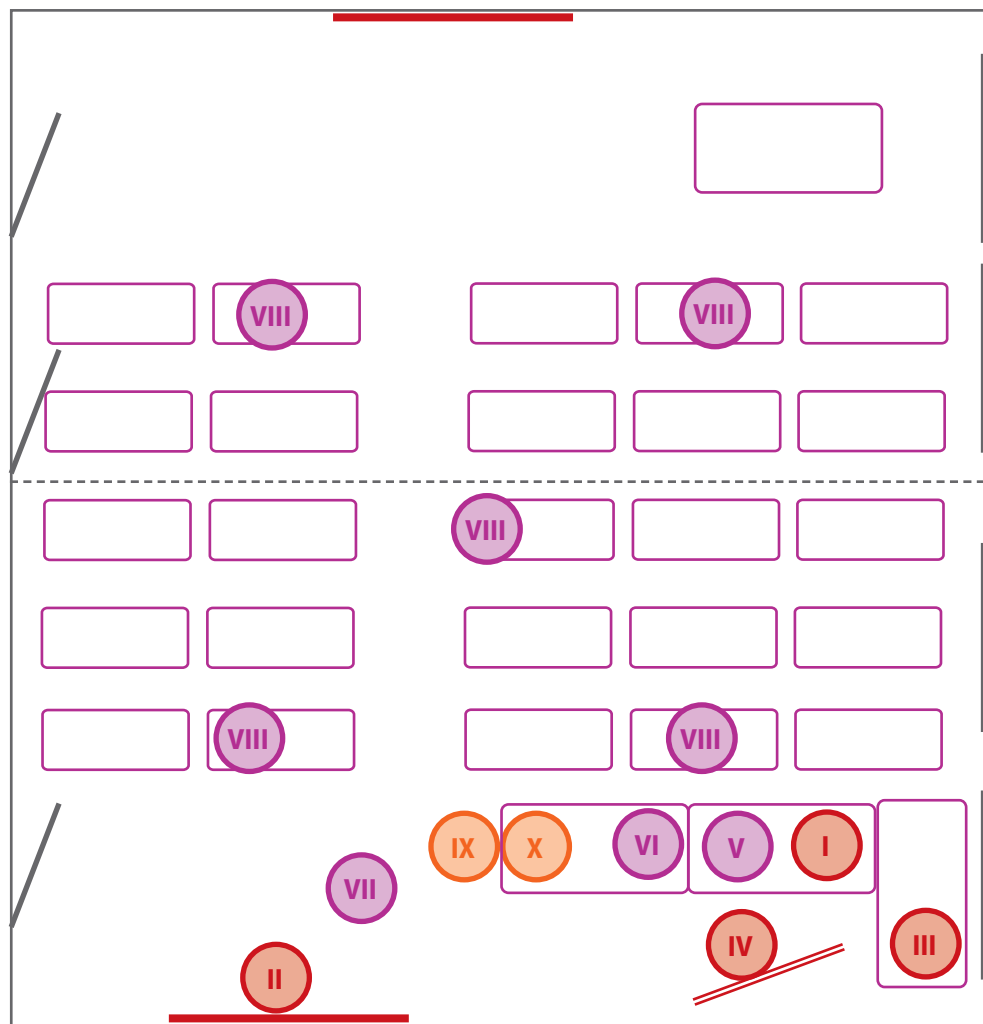
V  **Trolley Rack with audio interface**
Mixes 6 microphone receivers & speaker
- II**  **Beamer**
with HDMI or VGA connection
(additional one on the opposite side)

VI  **Loudspeaker**
for up to 50 people
- III**  **Laptop**
with online connection

VII  **Clip-on Microphone**
Speaker's micro
- IV**  **Big screen**
with HDMI connection to show
digital audience
(extra laptop is necessary to facilitate)

VIII  **Microphones 1-5**
Audience micros on tables
- IX**  **Camera 1**
Speaker's camera (follows speaker)
- X**  **Camera 2**
In-room audience camera

Classroom ZO-4-6/7/8
can be divided
(but only one set for
a hybrid lecture
in ZO-4-8)



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Technical equipment in Room ZO-4-6/7/8

Scan the QR-Code
to see the manual



Equipment installed



Furman Trolley Rack with audio interface
Mixes 6 microphone receivers & speaker



Bose Loudspeaker
for up to 50 people



Sennheiser Clip-on Microphone
Speaker's micro

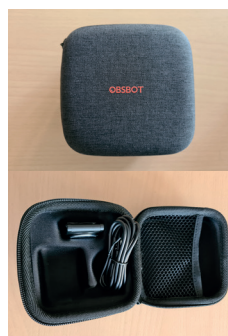


5x Sennheiser Table Microphones
Audience micros on tables



OBSBOT Tiny 4K Camera
(can track speaker and zoom in/out)

Inclusive:
» stand (eye level)



JABRA PanaCast Camera
(180° view)

Inclusive:
» on-table stand



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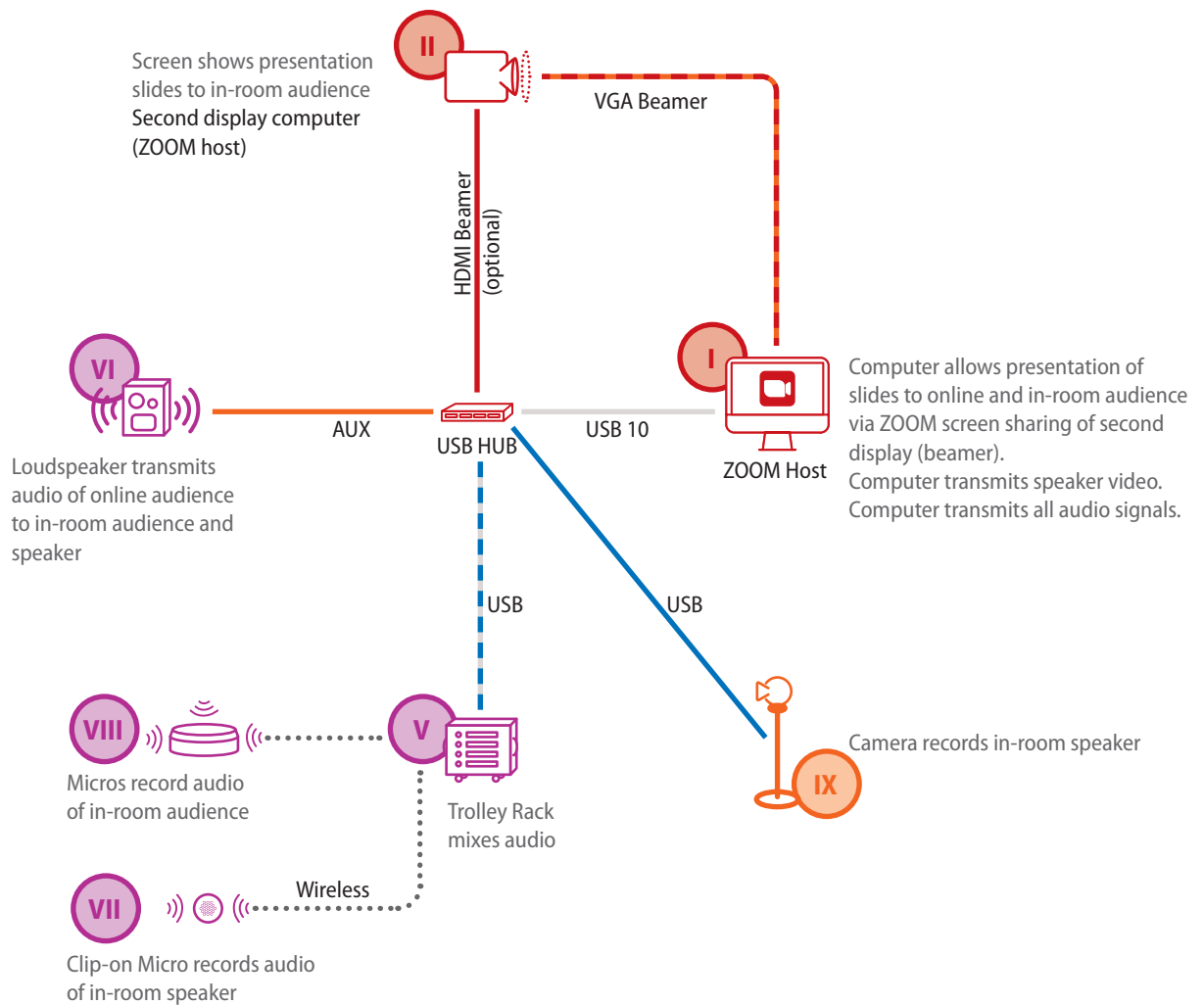
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Technical equipment in Room ZO-4-6/7/8

Connections

Main set-up

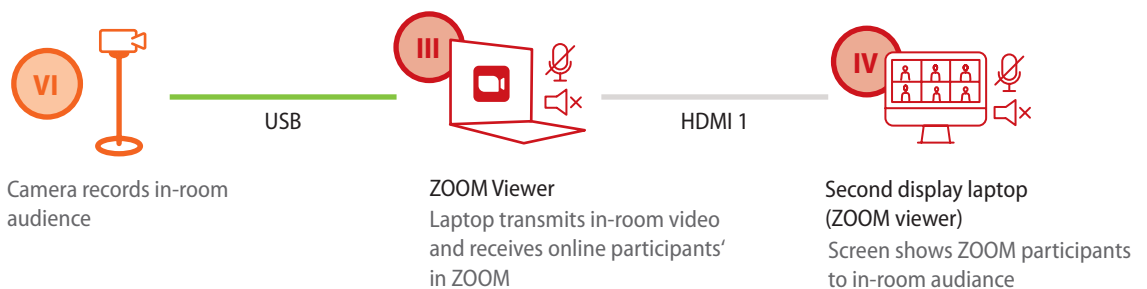


Display setting computer

Option 1 (recommended): Display of computer is **expanded** to second screen (beamer). PowerPoint presentation mode is started and presentation view moved to second screen (beamer). Presenters mode stays on first screen (computer). Beamer screen is shared via ZOOM. Control bar of ZOOM-screensharing and online participants video (floating around) should be moved via drag and drop to computer screen (first screen).

Option 2: Display of computer is **mirrored** to second screen (beamer). However, the speaker can not see presenters mode of PowerPoint anymore.

Support of community feeling in lecture



The big screen allows the display of the online audience to in-room audience and speaker.

The camera allows transmission of in-room audience video to online audience.

-> For this the ZOOM viewer (second device / laptop) is needed.



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Technical equipment in Room ZO-4-6/7/8

Installation steps

Main set-up

Save the lecture slides on the server.
(Alternative: on a USB stick if you use your own laptop; if so, you need two laptops)

Get the key to trolley rack.

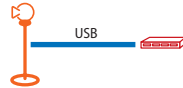
Turn on multiple socket, the computer and the beamer
(turn on VGA; if you use your own laptop switch to HDMI).



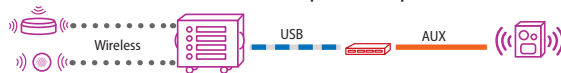
Choose VGA of beamer for second extended display.
(with your own laptop you need to switch to HDMI)

Login to your account on the computer. Open lecture slides
from server. (Alternative: Connect USB stick to USB hub /
computer and get slides from stick)

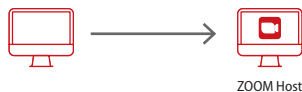
Get micros and speaker camera out of the trolley rack.
Connect camera to stand and USB cable to USB hub.
Turn on micros.



Turn on trolley rack, loudspeaker and micros.
Distribute muted audience micros in room.
Clip on the speaker micro.



Start the ZOOM session on the computer.
(Computer needs to be host.)



Start PowerPoint presentation and move
presentation view to second display (beamer).
Share second display via ZOOM.

ZOOM audio and video:
Loudspeaker = "Headphones"
Micro = "Loopback L+ R"
Speaker Camera = "OSBOT Tiny 4 K"

Support of community feeling in lecture

1

2

3

4

5

6

7

8

9

10

11

Bring your laptop with you.

Connect your laptop to power supply / multiple socket,
the LAN cable, and the HDMI1 of the extra screen.



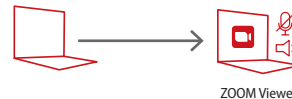
Turn on your laptop and the extra screen
(via remote control).

Choose HDMI 1 of the extra screen for second mirrored display.

Get audience camera and stand out of the trolley rack.
Connect camera to stand and via USB cable to laptop.



Enter the same ZOOM session on your laptop,
but without audio. (Laptop is additional participant.)



ZOOM audio and video:
Loudspeaker / micro = turned off
Audience Camera = "Jabra PanaCast"

Make sure your applications (e-mail, jabber) are turned off.

Gesture control
signals of speaker
camera



zoom
in/out

(de)focus
on speaker

camera blinks in blue
when processing
signal and turns
green when instruc-
tion is executed



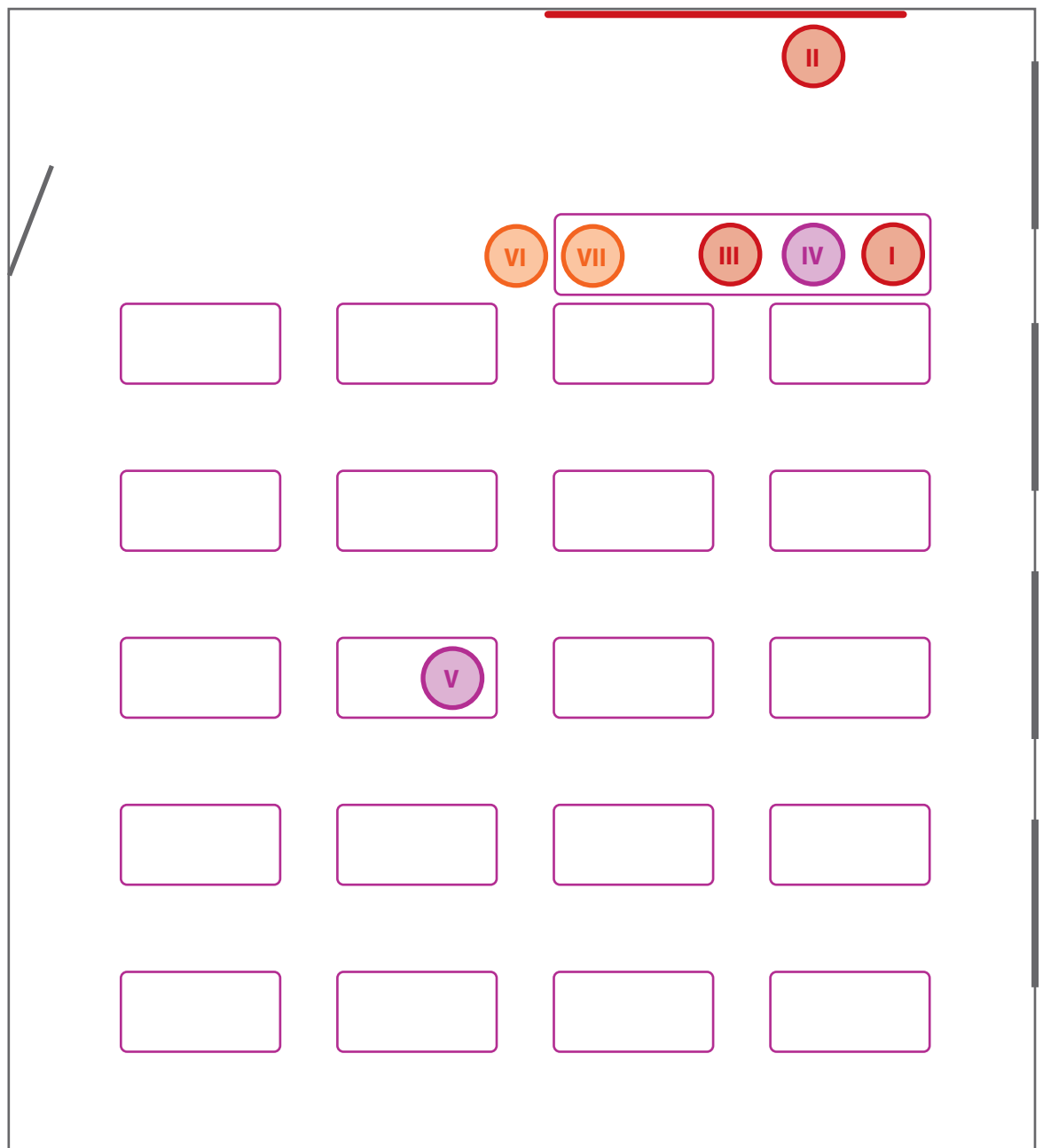
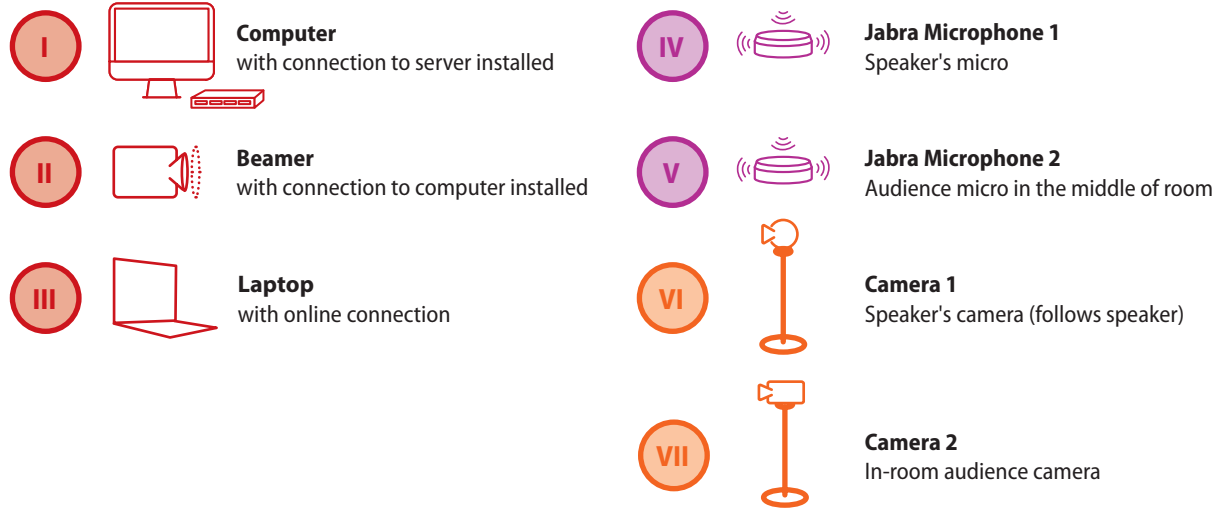
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Technical equipment in Room ZS-7-10

Room plan



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Technical equipment in Room ZS-7-10

Scan the QR-Code
to see the manual



Equipment installed

IV



Jabra speak 710 Microphone 1
Speaker's micro



V



Jabra speak 710 Microphone 2
Audience micro in the middle of room

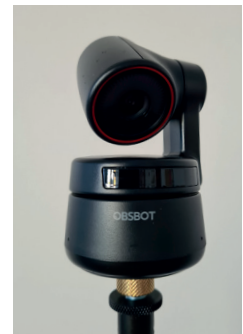
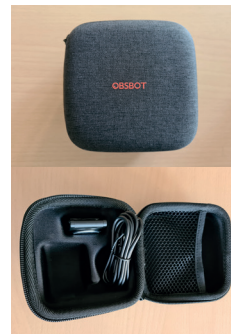


VI



OBSBOT Tiny 4K Camera
(can track speaker and zoom in/out)

Inclusive:
» stand (eye level)



VII



JABRA PanaCast Camera
(180° view)

Inclusive:
» on-table stand



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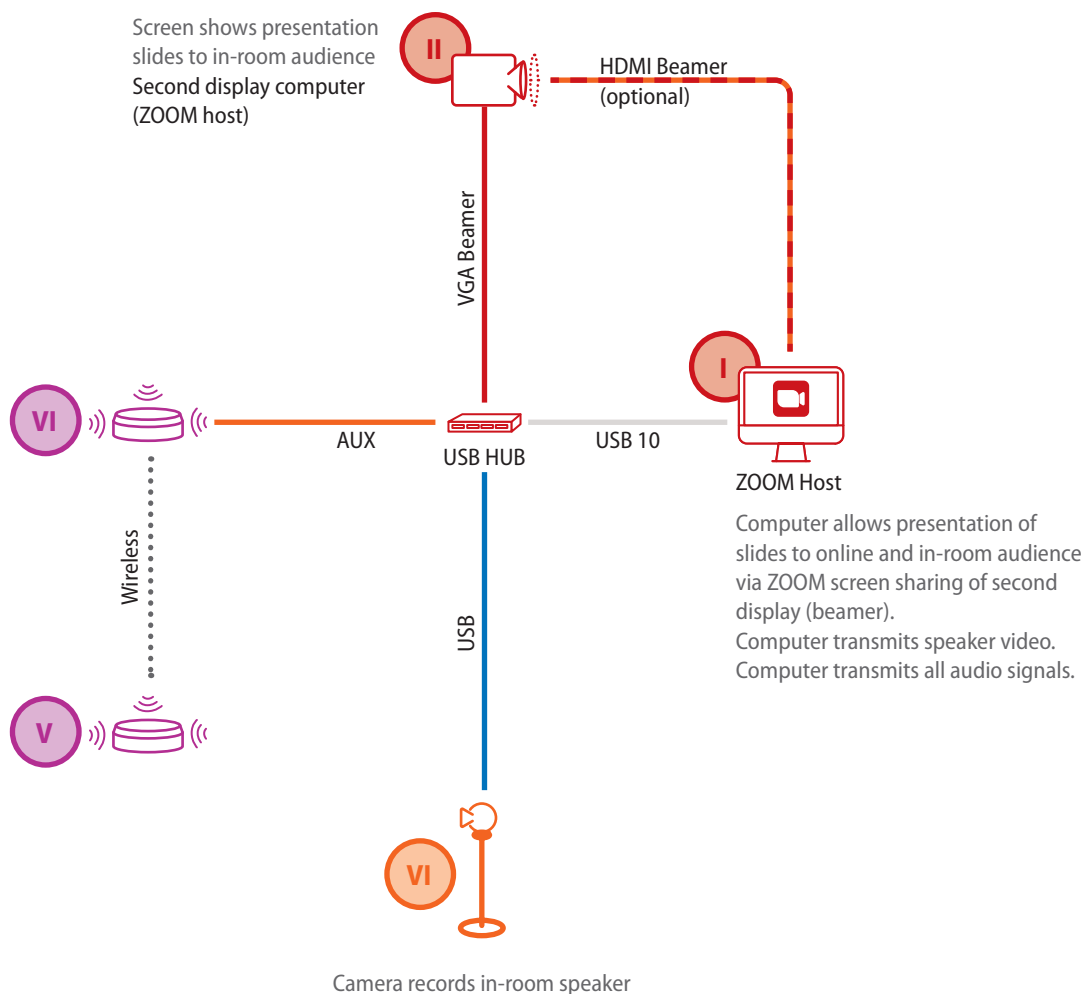
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Technical equipment in Room ZS-7-10

Connections

Main set-up

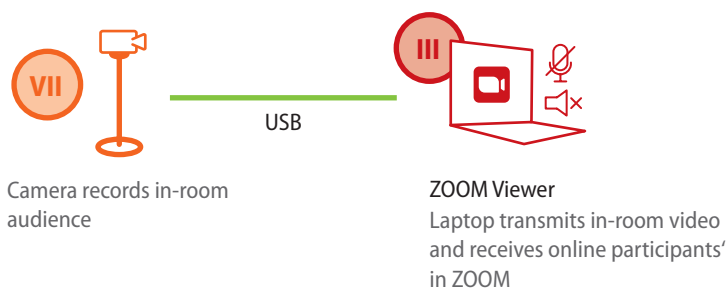


Display setting computer

Option 1 (recommended): Display of computer is **expanded** to second screen (beamer). PowerPoint presentation mode is started and presentation view moved to second screen (beamer). Presenters mode stays on first screen (computer). Beamer screen is shared via ZOOM. Control bar of ZOOM-screensharing and online participants video (floating around) should be moved via drag and drop to computer screen (first screen).

Option 2: Display of computer is **mirrored** to second screen (beamer). However, the speaker can not see presenters mode of PowerPoint anymore.

Support of community feeling in lecture



The camera allows transmission of in-room audience video to online audience.
 -> For this the ZOOM viewer (second device / laptop) is needed.



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Technical equipment in Room ZS-7-10

Installation steps

Main set-up

Save the lecture slides on the server.
(Alternative: on a USB stick if you use your own laptop; if so, you need two laptops)

Get the key to trolley rack.

Turn on multiple socket, the computer and the beamer
(turn on VGA; if you use your own laptop switch to HDMI).



Choose HDMI of beamer for second extended display.
(with your own laptop you need to switch to VGA)

Login to your account on the computer. Open lecture slides
from server. (Alternative: Connect USB stick to USB hub /
computer and get slides from stick)

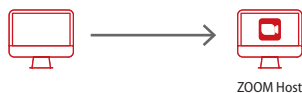
Get micro-speakers and speaker camera out of the suitcase.
Connect camera to stand and USB cable to USB hub.
Turn on micros and connect one via USB cable to USB hub.



Turn on micro-speakers and connect both
by touching the link sign at the same time.
Place audience micro in the center of the room and speaker
micro on the table in front of you..



Start the ZOOM session on the computer.
(Computer needs to be host.)



Start PowerPoint presentation and move
presentation view to second display (beamer).
Share second display via ZOOM.

ZOOM audio and video:
Loudspeaker = "Jabra Speak 710"
Micro = "Jabra Speak 710"
Speaker Camera = "OSBOT Tiny 4 K"

Support of community feeling in lecture

Bring your laptop with you.

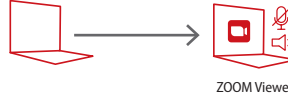
Connect your laptop to power supply.

Turn on your laptop and the extra screen
(via remote control).

Get audience camera and stand out of the suitcase.
Connect camera to stand and via USB cable to laptop.



Enter the same ZOOM session on your laptop,
but without audio. (Laptop is additional participant.)



ZOOM audio and video:
Loudspeaker / micro = turned off
Audience Camera = "Jabra PanaCast"

Make sure your applications (e-mail, jabber) are turned off.

Gesture control
signals of speaker
camera



zoom
in/out



(de)focus
on speaker

camera blinks in blue
when processing
signal and turns
green when instruc-
tion is executed



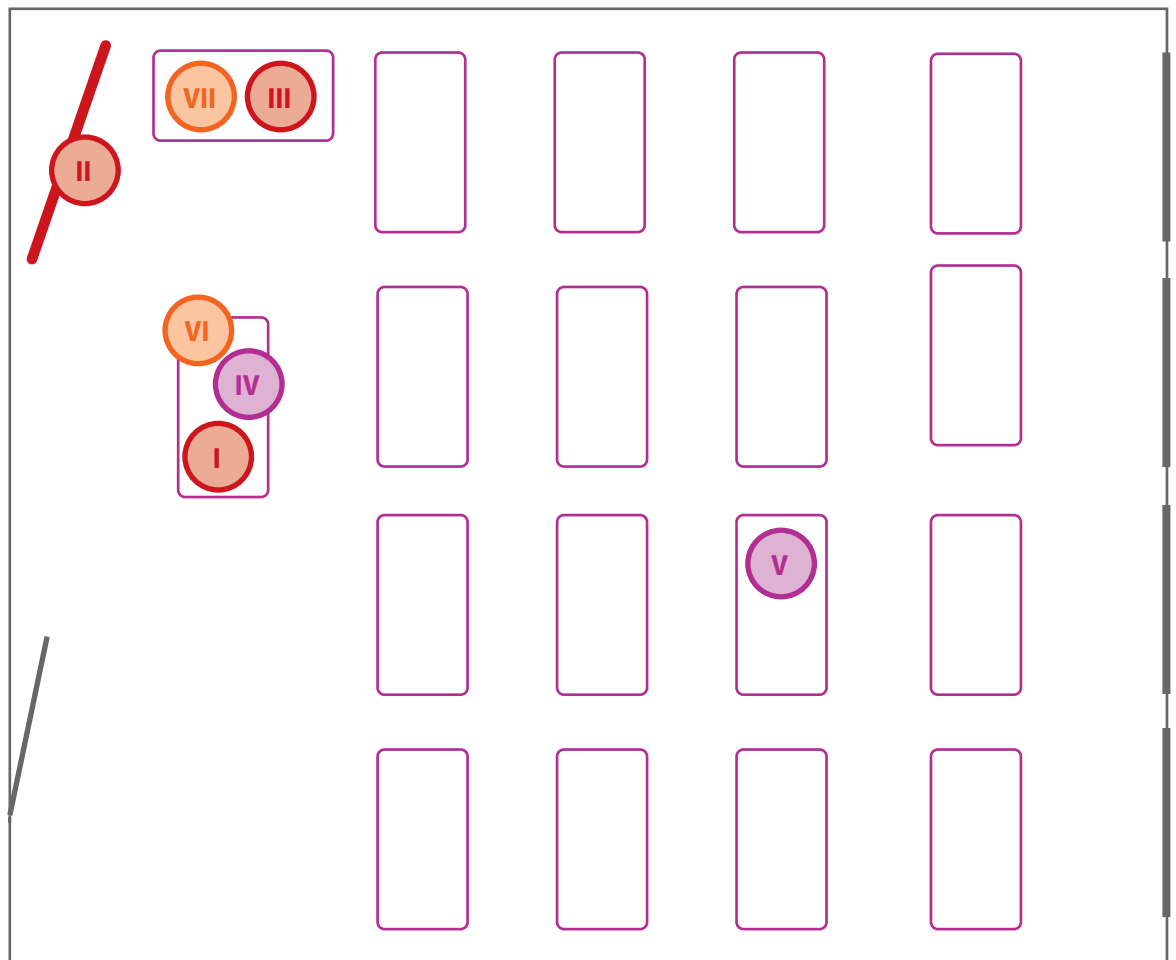
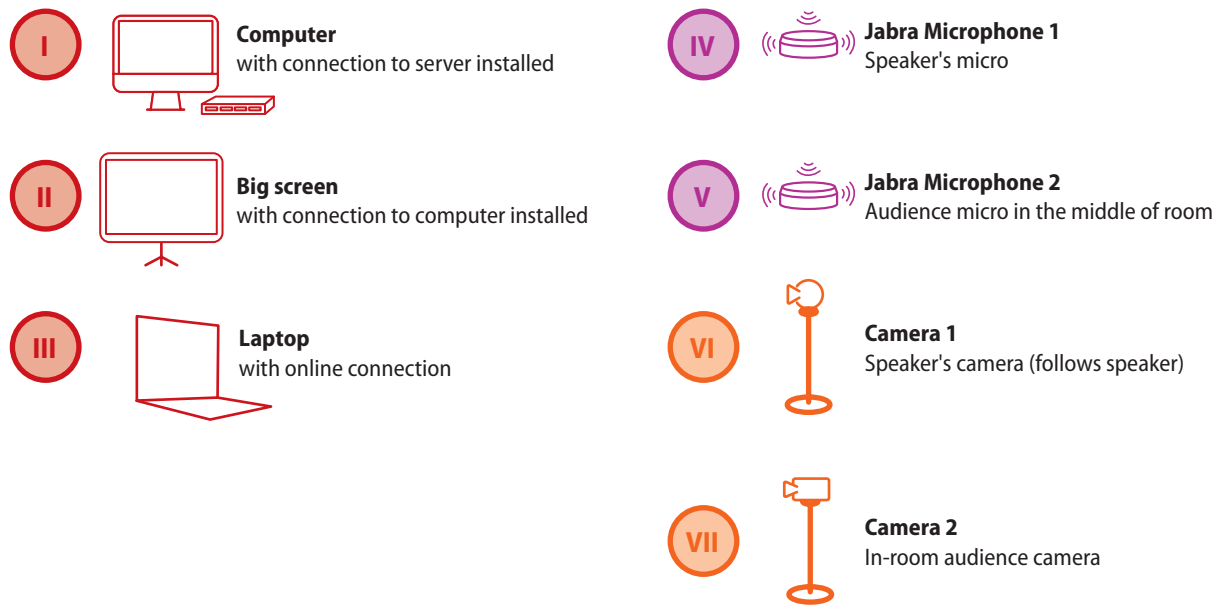
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Development and
Infrastructure Systems

Technology
Arts Sciences
TH Köln

Technical equipment in Room ZN-4-5

Room plan



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Scan the QR-Code
to see the manual



Equipment installed

IV



Jabra speak 750 Microphone 1
Speaker's micro



V



Jabra speak 750 Microphone 2
Audience micro in the middle of room

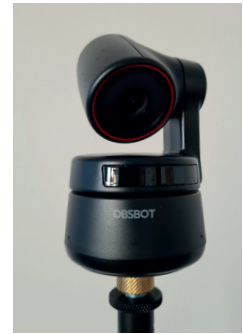
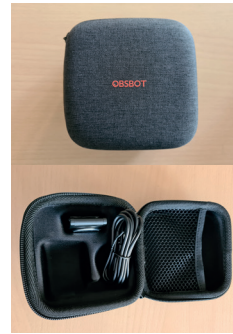


VI



OBSBOT Tiny 4K Camera
(can track speaker and zoom in/out)

Inclusive:
» stand (eye level)



VII



JABRA PanaCast Camera
(180° view)

Inclusive:
» on-table stand



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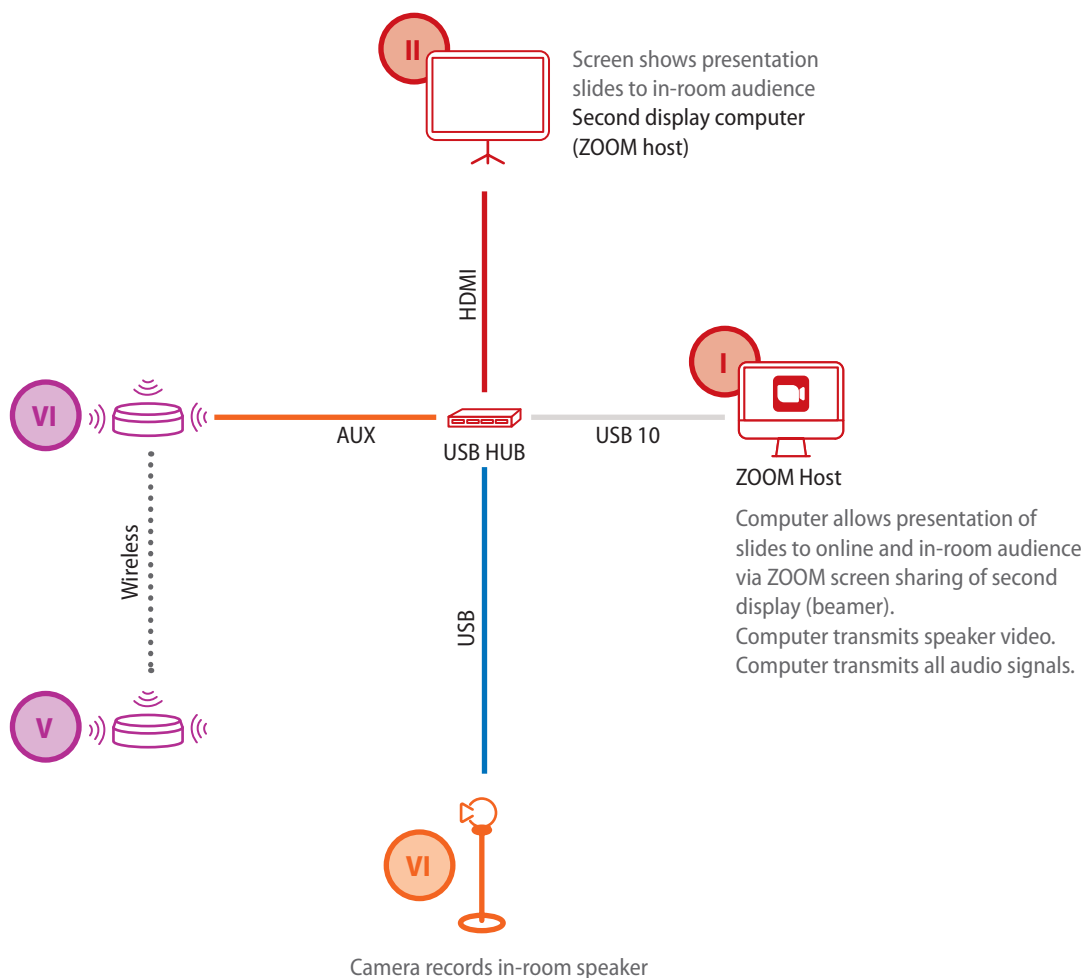
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Connections

Main set-up

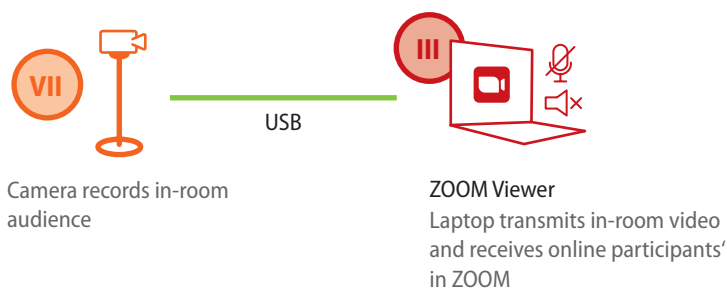


Display setting computer

Option 1 (recommended): Display of computer is **expanded** to second screen (big screen). PowerPoint presentation mode is started and presentation view moved to second screen (big screen). Presenters mode stays on first screen (computer). Big screen is shared via ZOOM. Control bar of ZOOM-screensharing and online participants video (floating around) should be moved via drag and drop to computer screen (first screen).

Option 2: Display of computer is **mirrored** to second screen (big screen). However, the speaker can not see presenters mode of PowerPoint anymore.

Support of community feeling in lecture



The camera allows transmission of in-room audience video to online audience.
-> For this the ZOOM viewer (second device / laptop) is needed.



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Installation steps

Main set-up

Save the lecture slides on the server.
(Alternative: on a USB stick if you use your own laptop; if so, you need two laptops)

Get the key to trolley rack.

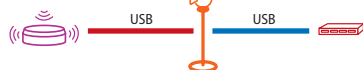
Turn on the computer and the big screen.



Choose HDMI of beamer for second extended display.
(with your own laptop you need to switch to VGA)

Login to your account on the computer. Open lecture slides from server. (Alternative: Connect USB stick to USB hub / computer and get slides from stick)

Get micro-speakers and speaker camera out of the suitcase.
Connect camera to stand and USB cable to USB hub.
Turn on micros and connect one via USB cable to USB hub.



Turn on micro-speakers and connect both by touching the link sign at the same time.

Place audience micro in the center of the room and speaker micro on the table in front of you..



Start the ZOOM session on the computer.
(Computer needs to be host.)



Start PowerPoint presentation and move presentation view to second display (big screen).
Share second display via ZOOM.

ZOOM audio and video:
Loudspeaker = "Jabra Speak 750"
Micro = "Jabra Speak 750"
Speaker Camera = "OSBOT Tiny 4 K"

Support of community feeling in lecture

1

Bring your laptop with you.

2

Connect your laptop to power supply.

3

4

Turn on your laptop.

5

6

7

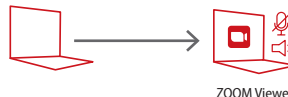
Get audience camera and stand out of the suitcase.
Connect camera to stand and via USB cable to laptop.



8

9

Enter the same ZOOM session on your laptop, but without audio. (Laptop is additional participant.)



10

11

ZOOM audio and video:
Loudspeaker / micro = turned off
Audience Camera = "Jabra PanaCast"

Make sure your applications (e-mail, jabber) are turned off.

Gesture control signals of speaker camera



zoom in/out (de)focus on speaker

camera blinks in blue when processing signal and turns green when instruction is executed



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Mobile equipment for hybrid teaching

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The following items can be borrowed and used:

Hollyland LARK 150 micro system (2-Person wireless micro system)

Inclusive:

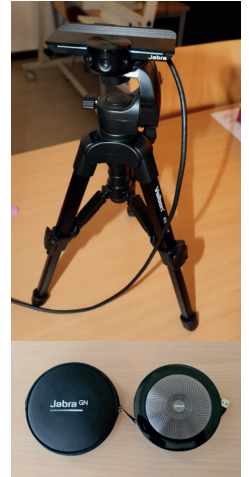
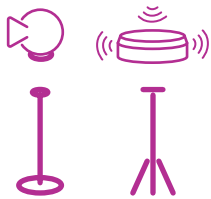
- » 2x transmitters
- » 1x receiver
- » 1x 3.5mm TRS to TRS cable
- » 2x lavalier microphone
- » 2x microphone windscreen
- » 1x Charging case + usb



JABRA Camera-Micro-/Speaker Kit (180° camera & 2-in-1 micro-speaker 710)

Inclusive:

- » on-table stand
- » on-table tripod



LOGITECH Tower (tower with integrated camera, micro & speaker)

Inclusive:

- » remote control



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