

Alternatives to classroom teaching

## Synchronous Online Teaching / Live Teaching in the Internet

As of: 28.03.2020



**You are wondering how to stream a lecture, seminar or consultation online? You would like to teach, discuss, and debrief live online? In this document we give you an overview of your current possibilities.**

We distinguish between synchronous and asynchronous online teaching. In synchronous online teaching, teaching and learning take place simultaneously, for example in a live stream or in a live chat. Synchronous online formats require a stable Internet connection and well-scaled software systems. Due to the current high demand, these systems will be overloaded again and again. For this reason, we recommend a predominantly asynchronous teaching strategy for the summer semester, supplemented by a few synchronous elements (see [Handbook Synchronous and Asynchronous Online Teaching](#)).

In this document you will find quick, pragmatic answers to the questions:

- [What are the basic success factors for online teaching?](#)
- [What should I consider when streaming live?](#)
- [How can I conduct an online lecture live from home with Zoom?](#)
- [How can I conduct an online seminar live from home with Zoom?](#)
- [How can I conduct an online meeting live from home with Meet?](#)
- [What support tools are available?](#)

We will continue to adapt this document to new developments; the most current version can be found on our website at <https://www.prolehre.tum.de/aktuelles/coronavirus>



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## What are the basic success factors for online teaching?

- **We distinguish between synchronous and asynchronous online teaching.** In synchronous online teaching, teaching and learning take place simultaneously, for example in a live stream or live chat. In asynchronous online teaching, the teaching and learning processes are decoupled in time, for example in an instructional video or in a discussion forum.
- **Synchronous online teaching requires a very good Internet connection and well-scaled software systems.** We are currently increasing the server capacity of our own systems (especially Moodle learning platform), but most other systems are operated by external providers, on whose load management we have little influence. Furthermore, it is unclear what kind of internet connection your students will have at home (we recommend a bandwidth of at least 16 Mbit/s downstream and 50 Kbit/s upstream).
- **We recommend a predominantly asynchronous teaching strategy, supplemented by a few synchronous elements.** We expect that by the beginning of the summer semester at the latest, many systems and networks will be overloaded and a predominantly synchronous online teaching will then be difficult to implement.
- **Teaching on screen is very different from classroom teaching:** It is more strenuous for both teachers and students, important non-verbal communication is reduced or even eliminated, and handling the technology requires more attention and new skills. A 1:1 transfer of face-to-face teaching into a video conference does not usually work. Therefore, you should consider which parts of your face-to-face event should be synchronous and which parts are better substituted asynchronously by instructional videos, reading or activities on Moodle.
- **University didactics for virtual university teaching is demanding** and requires a lot of planning and preparation time. We hope, however, that the crisis situation will increase the willingness on all sides to make the best out of the situation with patience, creativity and personal responsibility. We will support you and your students technically and didactically to make your online teaching as good as possible.
- **Establish a central point of contact for your course early on:** Communicate to your students as early as possible that they will find all important information on the course page in Moodle. Update the page gradually as you learn more about the form and schedule of your course. This way you can get students on board early and prevent misunderstandings.
- **Prepare yourself now:** Use the weeks leading up to the start of the semester to design a teaching concept, to acquire technology and familiarise yourself with techniques, to seek advice, to adapt learning objectives to the new situation, to shorten content, to research or sift through external teaching material, perhaps to share work with colleagues at other universities, or to seek our advice.
- **Get to know the wide range of possibilities:** In this document we focus on live streaming. But you have (and need) a broad repertoire to teach successfully online in the medium term. In our handbook "asynchronous and synchronous online teaching" we have summarized many pragmatic building blocks for you.

## What should I consider when streaming live?

- Familiarize yourself with the tools that suit you best, both mentally and practically. **Test** each tool in advance with a few colleagues in a separate session - preferably at the same place, using the same equipment.
- Plan and communicate the exact **times and access** to all participants. If possible, hold the sessions outside of **peak hours** (10:00-16:00) to avoid overloading the systems.
- Ask your students to **call in early**, about 10 minutes for the first few meetings, to get the equipment up and running reliably; it usually takes a few minutes before everything is ready. Students can turn off their picture/sound after successful connection and do whatever else they need to do before the meeting begins.
- Consider offering **emergency communication** (e.g. Chat or Tweedback) so that students who cannot dial in can still participate.
- Advise students to connect their devices via **network cable** if possible (instead of using the WLAN) and, if possible, to have alternative devices (e.g. smartphones) ready should connection problems occur; sometimes the smartphone with 4G works better than the laptop with Eduroam (keep an eye on costs).
- If the vendor provides an **app**, use it instead of the browser version.
- If possible, use the **recording function** in order to be able to provide the students with a recording afterward, especially in case of disturbances (but the students must agree to this).
- To save bandwidth, you and/or your students can turn off the **video** (or reduce the quality in the settings) and only turn it on when needed.
- Use a **headset** to improve the voice quality and avoid feedback.
- An **assistant** who takes over the technical support (and possibly keeps an eye on the chat) can help you to concentrate on the content and the person to whom you are talking.
- Consider how to **initiate** and moderate an online session in a sensible way.
- At the beginning, briefly address **etiquette** in your digital space. For example, make **hand signals** with your students for participation (question/message, approval), advise your students to use **chat functions** sparingly, as they have a great potential for distraction, agree with your students to **mute the microphones** and only activate them when they are speaking in order to avoid noise (e.g. keystroke, feedback).
- Take into account the **time lag**. Speak more slowly than usual. Take more pauses than usual. Wait longer than usual for a reaction or for an answer to a question.

We would be pleased to advise you within the scope of our capacities. On our website, <https://www.prolehre.tum.de/aktuelles/coronavirus>, you will find various information and contact options, as well as links to the exchange forum for digital teaching and to our service channel in the university chat.

## How can I conduct an online lecture live from home with Zoom?



### Zoom Webinar in brief



#### Summary

Tool:	Zoom Webinar
Provider:	External (Zoom)
Website:	<a href="https://zoom.us">https://zoom.us</a>
Integration in Moodle:	Linked
Lecturer login:	TUM-ID (Shibboleth Connection)
Student login:	Per Invitation Link
# of Participants:	Up to 100 Students („interactive“) or up to 1.000 Students („watch-only“)
Platform:	Instructor: Web-based Students: Web-based or App
Performance	▲ So far, no performance issues have been observed.
Privacy Policy	Clarified in framework agreement between TUM/Zoom.

#### Scenarios

- **Presentation:** Video/Audio comes from lecturer; screen sharing possible, e.g. to show documents, images, videos; PowerPoint presentation mode not possible (PDF possible)
- **Interaction:** Students can ask questions and participate in voting via a chat; external Interaction tools, like Tweedback, can be used
- **Archiving:** possible

#### Onboarding

Short training period (about 5-10 minutes)

#### Instructions

Overview: <https://blog.zoom.us/wordpress/2020/03/04/best-practices-for-hosting-a-digital-event>. Video tutorials: <https://support.zoom.us/hc/de/articles/206618765-Zoom-Video-Tutorials>. Instructions: <https://support.zoom.us/hc/en-us/sections/200324965-Video-Webinar>

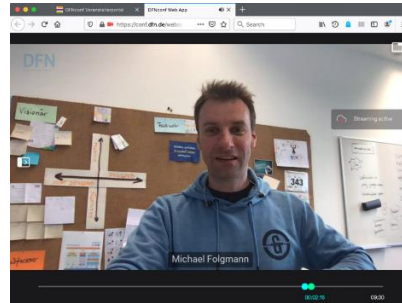
#### Alternatives

In a first version of this document, we recommended [Pexip](#) (DFN), but unfortunately there were ▲ performance problems. Therefore TUM decided to purchase Zoom.

For performance problems: Streaming via ▲ YouTube or ▲ Twitch (attention: privacy policy not clarified)

## How can I conduct an online lecture live from home with Zoom?

**DFN**  
DEUTSCHES FORSCHUNGNETZ  
**DFNConf**  
Pexip



<b>Summary</b>	Tool:	DFNConf/Pexip
	Provider:	Extern (DFN)
	Website:	<a href="https://my.conf.dfn.de">https://my.conf.dfn.de</a>
	Integration in Moodle:	Linked
	Instructor login:	TUM-ID
	Student login:	By invitation link
	# of Participants:	No limit (by streaming use without meeting room function)
	Platform:	Instructors: Web-based Students: Web-based or client
	Performance	▲ Due to current high workloads, server problems and performance drops can occur.
	Privacy Policy	The data is stored on servers in Germany.

- Scenarios**
- Presentation: Video/audio only from lecturer; screen sharing for lecturer possible, e.g. to show documents, pictures, videos; PowerPoint presentation mode not possible (PDF possible)
  - Interaction: students can only ask questions via chat, not via video/audio; external interaction tools such as Pingo, Tweedback can be used
  - Recording/archiving possible

**Onboarding** Very short training period (about 5 minutes)

**First Steps** Live streaming: Register in the tool and create a *Lecture*; in the settings of the lecture, activate *streaming*, *streaming chat* and *mute guests* and deactivate *guests may present*. Under Organizer layout set *Full-screen main speaker only*. A URL will be generated which must be made available to the students. These settings are important to ensure that only the presenter is visible (live stream) and that many people can be reached at the same time. Also make sure not to select "Meeting" instead of "Lecture" by mistake, otherwise the number of participants is limited to 23 and another set of functions will be activated.

**Alternatives** For performance problems: Streaming via ▲ YouTube or ▲ Twitch (for Information, see [Workarounds](#))

## How can I conduct an online seminar live from home with Zoom?



### Zoom Meeting [in brief](#)



#### Summary

Tool:	Zoom Meeting
Provider:	External (Zoom)
Website:	<a href="https://zoom.us">https://zoom.us</a>
Integration in Moodle:	Linked
Instructor login:	TUM-ID (Shibboleth)
Student login:	By invitation link
# of Participants:	1-100
Platform:	Instructors: Web-based Students: Web-based or App
Performance:	▲ So far no performance issues have been observed.
Privacy Policy:	Clarified in framework agreement between TUM/Zoom.

#### Scenario

- Presentation: Lecturer usually transmits video/audio; screen sharing for lecturer possible, e.g. to show documents, pictures, videos; PowerPoint presentation mode possible
- Interaction: Video/audio of students can be shared, students can also present themselves after approval by the instructor; students can ask questions via chat, collaborative whiteboard, integrated live voting, group work mode
- Recording/archiving possible

#### Onboarding

Short training period (about 5-10 Minutes)

#### First Steps

[Video tutorials](#) und [Instructions](#) for getting started and [simple tips for online seminars](#). Advanced: [How to become a Zoom Poweruser](#).

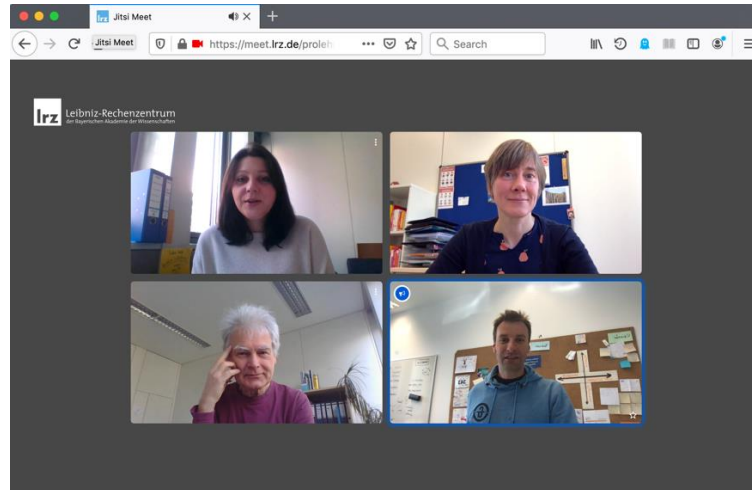
#### Troubleshooting

In a first version of this document, we recommended [Adobe Connect](#) (DFN), unfortunately there were ▲ performance problems. Therefore, TUM has decided to purchase Zoom.

## How can I conduct an online meeting live from home?



Jitsi  
Meet



### Summary

Tool:	Meet
Provider:	External (LRZ)
Website:	<a href="https://meet.lrz.de">https://meet.lrz.de</a>
Integration in Moodle:	Linked
Instructor login:	TUM-ID (Shibboleth)
Student login:	By invitation link
# of Participants:	1-5
Platform:	Instructors: Web-based Students: Web-based or App
Performance:	▲ There may be performance degradation with high usage of this service.
Privacy Policy:	The data is stored on servers in Germany.

### Scenario

- Lecturers and students transmit video/audio.
- Screen sharing for all participants possible, e.g. to show documents, pictures, videos; PPT presentation mode not possible (PDF possible instead).
- Recording/archiving possible

### Onboarding

Very short training period (about 5 minutes)

### First Steps

Assign a meeting name on <https://meet.lrz.de>, log in as „Organizer“ with TUM-ID and send the link to the students. Software runs in the browser, webcam and microphone must be enabled there.

User documentation: <https://doku.lrz.de/pages/viewpage.action?pageId=17694833>

### Alternatives

In case of performance problems, you can switch to a ▲ Zoom meeting.



## What support tools are available?

The following tools can be used to support your online course:



Your students should have a central contact point; we recommend a Moodle course at <http://moodle.tum.de>. From there, you can, for example, link your live streams (as well as slides that they discuss during your stream). You can also link to a chat channel (in RocketChat) or forum (in Moodle) where students can post if they have technical problems accessing their live stream

**RocketChat**



<https://chat.tum.de> is the WhatsApp/Slack of TUM. It can be used to easily send messages and documents. All teachers and students have access to RocketChat with their TUM-ID. There you can set up your own channel for your course.



<https://tum.tweedback.de> is actually a live voting tool for classroom teaching. The Tweedback chat wall is also ideal for providing students with chat feedback within a video conferencing system.



With Etherpad, your students can create notes or transcripts together. Etherpad is available either as an activity within Moodle or standalone at <https://etherpad.org>. If you need to do more drawing than writing, <https://drawpile.net> might be of interest to you (but we haven't tried it out yet).

It is possible that during the live stream an assistant can keep an eye on the forum or the chat for you, because it is not easy to follow the chat while simultaneously talking and moderating.

## Interesting Articles

- **Avoiding Mischief and Mayhem in the Great Leap to Zoom.** As the coronavirus forces many courses onto videoconferencing platforms, instructors and institutions can take small but important steps to ensure effective use and communication, Jody Greene writes: <https://insidehighered.com/digital-learning/advice/2020/03/25/avoiding-mischief-and-mayhem-great-educational-leap-zoom>
- **Zoombombing Attacks Disrupt Classes.** Online Zoom classes were disrupted by individuals spewing racist, misogynistic or vulgar content. Experts say professors using Zoom should familiarize themselves with the program's settings: <https://insidehighered.com/news/2020/03/26/zoombombers-disrupt-online-classes-racist-pornographic-content>