

LIVE STREAMING CONSIDERATIONS FOR INSTRUCTION

A planning guide to support school districts with hybrid instruction

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OVERVIEW

Educational agencies across the world are being asked to provide instruction via remote access or a combination of remote and live instruction. This guide contains details intended to assist school districts with planning their technology needs for various scenarios throughout the upcoming school year. Situations may arise where some students return to the classroom while some students are remote, all teachers are on site and students are remote, or some combination of the above. There are several approaches to providing instruction being considered.

Below are our definitions to aid planning discussions:

Synchronous: Live instruction where the teacher and student are on-line via audio, video, and/or chat at the same time. For the purposes of planning, synchronous video is the main consideration.

Asynchronous: Digital content with teacher guidance is provided in a digital platform ahead of time and students can access the content on demand.

Hybrid: Teachers simultaneously deliver content through a live synchronous session (audio, video, and/or chat) to students in person and remote students.

Blended: A mix of both synchronous and asynchronous instruction designed to maximize the benefit of each for students regardless of their location.

Technology can be unpredictable. There are many, many details and circumstances to plan for. The intention of this guide is to provide points to consider relative to the implementation and use of technology and live streaming instruction.

A GUIDE FOR MINIMUM TECHNOLOGY REQUIREMENTS BASED ON INSTRUCTIONAL APPROACH

		ENTIRELY REMOTE	STUDENTS REMOTE, TEACHERS AT SCHOOL	SOME STUDENTS AT HOME, SOME AT SCHOOL, WITH TEACHER AT SCHOOL (HYBRID)						
1	SYNCHRONOUS Instruction is delivered in real time. Teachers and students are learning at the same time regardless of location.									
STU	JDENTS	1:1 Devices Home Internet Service Provider with sufficient bandwidth MiFi/WIFI Extenders or adequate cellular hotspots (Kajeet, Verizon)	1:1 Devices Home Internet Service Provider with sufficient bandwidth MiFi/WIFI Extenders or adequate cellular hotspots (Kajeet, Verizon)	Devices as needed Home and School Internet Service Provider with sufficient bandwidth MiFi/WIFI Extenders or adequate cellular hotspots (Kajeet, Verizon)						
TEA	ACHERS	Instructor Toolkit* Home Internet Service Provider with sufficient bandwidth MiFi/WIFI Extenders or adequate cellular hotspots (Kajeet, Verizon)	Instructor Toolkit* School bandwidth needs to align with Instructional Plans, taking into consideration the additional bandwidth that videos and other resources may consume.	Instructor Toolkit* School bandwidth needs to align with Instructional Plans, taking into consideration the additional bandwidth that videos and other resources may consume.						
2 ASYNCHRONOUS Content and directions are provided in a digital platform ahead of time and student access that content on demand.										
STU	JDENTS	1:1 Devices Home Internet Service Provider with sufficient bandwidth MiFi/WIFI Extenders or adequate cellular hotspots (Kajeet, Verizon)	1:1 Devices Home Internet Service Provider with sufficient bandwidth MiFi/WIFI Extenders or adequate cellular hotspots (Kajeet, Verizon)	1:1 Devices Home Internet Service Provider with sufficient bandwidth MiFi/WIFI Extenders or adequate cellular hotspots (Kajeet, Verizon)						
TEA	ACHERS	Instructor Toolkit* Home Internet Service Provider with sufficient bandwidth MiFi/WIFI Extenders or adequate cellular hotspots (Kajeet, Verizon)	Instructor Toolkit* Sufficient school bandwidth**	Instructor Toolkit* Current school bandwidth**						
3	BLENDED	A mix of both synchronous and asynchronous instruction designed to use each for maximum benefit to students.								
STU	JDENTS	1:1 Devices Home Internet Service Provider with sufficient bandwidth MiFi (adequate cellular hotspots, ex. AT&T, T-Mobile, Verizon)	1:1 Devices Home Internet Service Provider with sufficient bandwidth MiFi (adequate cellular hotspots, ex. AT&T, T-Mobile, Verizon)	1:1 Devices Home Internet Service Provider with sufficient bandwidth MiFi (adequate cellular hotspots, ex. AT&T, T-Mobile, Verizon)						
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* Basic Instructor Toolkit includes desktop/laptop, headset, microphone, webcam (if needed). Variations to this toolkit may exist. ** See corresponding sections about Internet Service and bandwidth in this guide (page 5).

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RECOMMENDATIONS TO MINIMIZE TECHNICAL STREAMING ISSUES

The following are safeguards to consider for minimizing technical connection and streaming issues.

1 Wherever possible, hardwire client devices that will be streaming video instruction and content. This will prevent bottlenecks and complications that could be associated with WiFi networks. 2 Limit streamed video to one live stream per classroom space, presumably the teacher. The more streams, the more bandwidth needed. 3 Students physically located in a classroom with a teacher should not access the teacher's streamed video content on their devices while in the classroom. Each time this happens, it adds a stream and bandwidth requirements. 4 Disable use of guest networks within the school district to better control bandwidth usage. 5 Use of BYOD networks should be limited to instructional use only to better manage bandwidth usage. 6 If laptops are being used, the internet and wireless networks should be adequate for the use they are being applied to. 7 Check to be sure devices are configured to, and have the hardware specifications to, send and/or receive live and streamed video. 8 Determine audio needs of the classroom, to determine if and what is needed with regards to microphones and/or speakers, for live instruction - keeping in mind the needs of both remote and in-person student participation. 9 Consider segmenting internet traffic for Administrators and support staff to ensure continuity of operation. Contact your MIT Lead for guidance. 10 Consider the bandwidth for ad hoc activities such as diagnostic testing and grading to ensure these functions don't impede instruction.

VENDOR ESTIMATED BANDWIDTH NEEDS BY CONCURRENT DEVICE

			1	25	100	150	200
Google Meet		Outbound/ Up (Mbps) Inbound/ Down (Mbps)	3.2 Mbps	80.0 Mbps	320.0 Mbps	480.0 Mbps	640.0 Mbps
Zoom		Outbound/ Up (Mbps) Inbound/ Down (Mbps)	3.0 Mbps	75.0 Mbps	300.0 Mbps	450.0 Mbps	600.0 Mbps
Microsoft Teams		Outbound/ Up (Mbps)	1.0 Mbps	25.0 Mbps	100.0 Mbps	150.0 Mbps	200.0 Mbps
		Inbound/ Down (Mbps)	2.0 Mbps	50.0 Mbps	200.0 Mbps	300.0 Mbps	400.0 Mbps

Notes:

- This information is provided as general guidance and may vary from actual usage.
- The bandwidth estimates shown are based on information published from these vendors.
- A bandwidth estimate should take into account day-to-day use by administration, staff, and students along with the new demands of streaming Synchronous instruction.
- Bandwidth consumption may vary based on several factors including video layout, available bandwidth, network congestion, etc.
- Most vendors will adjust video quality to adapt to available bandwidth and network conditions.
 Teachers may need to live stream instruction from places other than school. In these situations, there is limited technical support
- that can be provided by either the district or the LHRIC. Teachers can test their home bandwidth using the bandwidth calculator.
 A device is a camera enabled laptop, desktop computer with a camera, a mobile phone, etc., that is used to join a session. If, for example, a teacher uses a camera-enabled Chromebook and a camera-enabled laptop, it would count as two devices.

BANDWIDTH MONITORING

LHRIC uses **CACTI**: A network monitoring and graphing tool which provides real-time network usage. Contact your Account Manager or MIT lead for access.



BANDWIDTH CALCULATORS

How much internet capacity (bandwidth) do I need for remote learning and teaching?

We continue to receive inquiries from teachers, students, families and local/state agencies about how much capacity is needed at home to support remote teaching/learning. There are so many things to take into consideration to answer this question such as, the number of devices you want to connect and how those devices are used.

We found some pretty cool online tools that will help you answer this question based on your situation:

 $\underline{https://broadbandnow.com/bandwidth-calculator}$

https://www.att.com/esupport/speed-calculator/index.jsp



HYBRID INSTRUCTION CHECKLIST FOR TEACHERS AND ADMINISTRATORS

Whether synchronous, asynchronous, hybrid or blended instruction is in place, one thing you can count on is that there will be glitches in the technology and disruptions in student or teacher access to the technology at one time or another. The checklists that follow provide general considerations to ensure a successful experience by all learners. You may have other items you want to add.

TEACHERS

- Know how the classroom hardware and software works and what the in person and remote experiences will be like for students.
- □ Know how to access tech support.
- Communicate clearly and quickly to students and parents/guardians when there are technical disruptions to classroom instruction.
- Provide students and/or parents/guardians with the necessary information for connecting with the teacher and/or classroom if internet connectivity is an issue at any time.
- Develop a clear set of classroom expectations for participation and behavior for both in person and remote students.
- Prepare with alternate activities for students in the event a technology isn't available or functioning as expected.
- Record and post synchronous sessions for students that are unable to attend.
- Supply a schedule of synchronous sessions ahead of time to minimize conflicts for students.
- □ Test hardware and software ahead of time to ensure that is it working as expected.
- Ensure all student rosters are complete and ready for all software systems being used ahead of time.
- Request training and professional development that will help to maximize instruction.
- Ensure students with special needs or ELL/ MLL students have access to the appropriate equivalent learning resources for both in person and remote participation.
- Be aware of local, state, and federal laws and policies for protecting students online (EdLaw 2d/Part 121, COPA, FERPA, HIPPA).
- Ensure all student rosters are complete and ready for all software systems being used ahead of time.

Each software system has different timelines and processes for rostering students. Be sure to check with your Data Department and/or Director of Technology ahead of time to see when student rosters will be available in the various systems you will be using the first weeks of school.

ADMINISTRATORS

- Establish taskforce committees to ensure stakeholder input is included in the development of reentry plans.
- Ensure that all students have equivalent access to instruction and content regardless of where they are participating from.
- Develop communication plans that cover all circumstances for stakeholders (internet outages, equipment failure, software glitches).
- Make updates or modifications to policies, guidelines, and handbooks that will ensure the privacy, safety, and security of all students (e.g, Acceptable Use Policy, Data Privacy & Security Policy, Student and Parent Handbooks).
- Identify all spaces that will be used for instruction. Work with technical teams to ensure there is adequate wireless access and bandwidth to meet instructional goals of those spaces (e.g. auditoriums, outside spaces).
- Determine if students at home have adequate technology to participate in the instructional plan remotely.
- Provide appropriate accessibility features for software and hardware where students need it. Several tools have accessibility features and tools built in.
- Develop protocols with teachers on getting access to virtual classes, content and student work as well as feedback.
- Communicate the requirements for participation to parents/guardians of students with special needs or ELL/ MLL students for both in person and remote instruction.
- Test all systems being implemented as fully as possible (check operation and bandwidth). Include building level administrators and teachers for feedback.
- Provide substitute teachers with the instructional plans and the requirements for using and access to the classroom hardware/software.
- Supply a variety of flexible training and professional development options for teachers that is ongoing throughout the year.
- Ensure all instructional resources are used in compliance with local, state, and federal policies and laws (EdLaw 2d/Part 121, FERPA, COPA, HIPPA, etc.).
- Create benchmark check-ins throughout the early months of re-entry to confirm things are progressing as planned, and to determine if any changes are needed (20 days, 45 days, etc.).

LHRIC CONTACTS & HELPFUL LINKS

LHRIC CONTACTS

Let's Get Connected! We are ready to help with your district's reentry plan!

Account Managers

John Hall Julie Martin Candice Cross Jean Benitez jhall@lhric.org jmartin@lhric.org ccross@lhric.org jbenitez@lhric.org Technical Services Manager Anthony Ferrante aferrante@lhric.org

Instructional Technology Manager Sarah Martabano smartabano@lhric.org

HELPFUL LINKS

NYSED Reopening Resources and Guidance

http://www.nysed.gov/reopening-schools/school-reopening-resources

NYS K12 INTERIM GUIDANCE FOR IN-PERSON INSTRUCTION PRE-K 12 (Initial caps) https://www.governor.ny.gov/sites/governor.ny.gov/files/atoms/files/Pre-K_to_Grade_12_Schools_MasterGuidence.pdf

Instructional Technology Using Online Conferencing Tools

https://it.lhric.org/using_online_conferencing_tools_

Digital Accessibility Toolkit for Leaders

https://www.cosn.org/sites/default/files/Digital%20Toolkit%20for%20508compliance.pdf

Data Privacy and Security Resource Page

https://riconedpss.org/resources

8 Tips to Create Effective Synchronous Learning Strategy

https://elearningindustry.com/8-tips-create-effective-synchronous-elearning-strategy

Remote Learning Communication: How to Best Connect with Students

https://www.techlearning.com/how-to/remote-learning-communication-how-to-best-connect-with-students

Continue Remote Learning for Students without Internet

https://edtechmagazine.com/k12/article/2020/04/continuing-remote-learning-students-without-internet

Work on Google Docs, Sheets & Slide offline

https://support.google.com/docs/answer/6388102?co=GENIE.Platform%3DDesktop&hl=en

Google Meet "Prepare your network for Meet video calls"

https://support.google.com/a/answer/1279090?hl=en

Zoom "System requirements for Windows, macOS, and Linux"

https://support.zoom.us/hc/en-us/articles/201362023-System-requirements-for-Windows-macOS-and-Linux#h_d278c327-e03d-4896-b19a-96a8f3c0c69c

System Requirements for Zoom Rooms

https://support.zoom.us/hc/en-us/articles/204003179-System-Requirements-for-Zoom-Rooms

Zoom Technical Deep Dive

https://blog.zoom.us/technical-deep-dive-how-we-live-streamed-zoomtopia-without-a-hitch/

Microsoft Teams "Prepare your organization's network for Microsoft Teams"

https://docs.microsoft.com/en-us/microsoftteams/prepare-network





