

Low-Bandwidth Teaching Strategies in Response to the COVID-19 Pandemic

Addressing Technology Access Inequity in Distance Learning and Online Education

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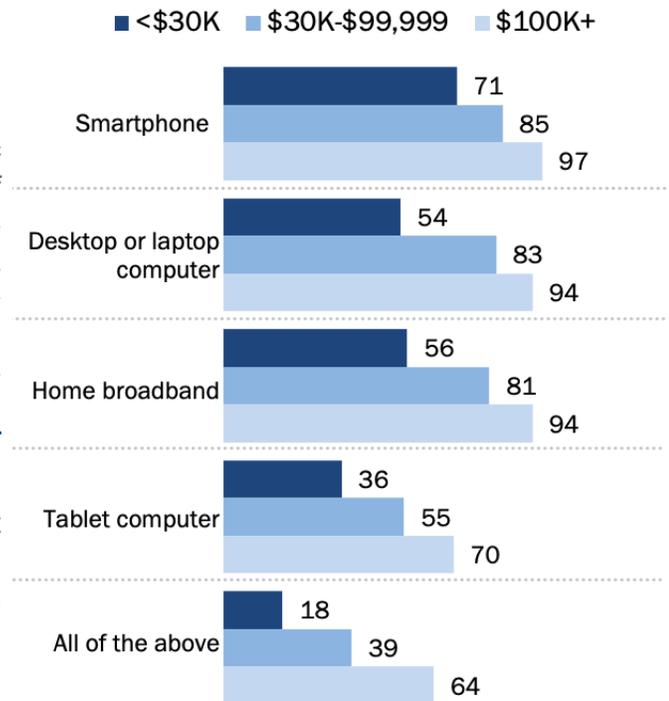
Meeting our children where they are with what we have.

As the reality of implications of the coronavirus pandemic continues, schools are opting for various degrees of distance learning ranging from blended to fully remote instruction. The purpose of this piece is to provide options for school systems to ensure *all* students receive quality education through a distance learning model with awareness that technology access inequity disproportionately affects [low-income](#) and [rural](#) communities.

Distance learning requires much more than an internet connection. We require students to demonstrate technology literacy that may or may not have been given the chance to develop throughout their education.

Lower-income Americans have lower levels of technology adoption

% of U.S. adults who say they have the following ...

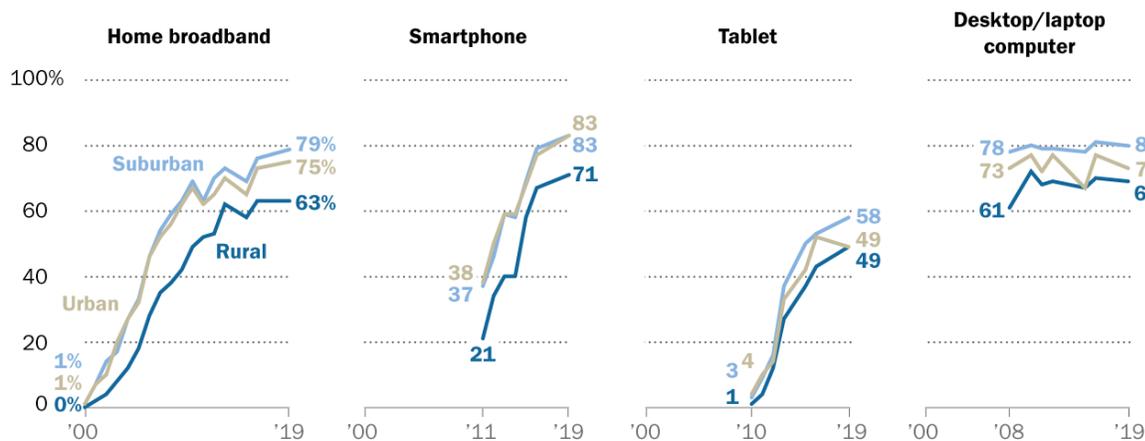


Note: Respondents who did not give an answer are not shown.
Source: Survey conducted Jan. 8-Feb. 7, 2019.

PEW RESEARCH CENTER

Rural Americans have consistently lower levels of broadband adoption

% of U.S. adults who say they have ...



Note: Respondents who did not give an answer are not shown.
Source: Survey conducted Jan. 8-Feb. 7, 2019. Trend data from other Pew Research Center surveys.

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With the shift to “online learning,” we are assuming that students have access to internet, devices, and knowledge that empowers them to effectively manage their own education when not present in school.

Distance learning is a term used here to acknowledge the tension between the necessity for students to learn outside of the classroom via online platforms, and the understanding of inequitable starting points of our students when it comes to levels of access to internet speeds, quality, and connected devices. Technology access is no longer an educational add-on, it is a functional utility that all students must have access to in order to narrow the disproportionate effects of COVID-19.

Low-bandwidth strategies are actions of crisis response, not permanent solutions.

Teaching cannot continue in crisis mode as was seen in many school districts across the United States. Technology access inequity exists, with sustainable funding necessary to create appropriate solutions. It is essential for schools, education leaders, and government to establish universal access to internet and connected devices both inside and outside of classrooms as technological literacy is increasingly a requirement for the creation of generational wealth. Until equity is achieved in technology access, low-cost and low-bandwidth strategies must be implemented into teachers’ instruction so that the pool of students with access to quality education is widened. Strategies such as these require the opportunity for offline access, integration with other online learning platforms, and accessibility from various devices to ease the transition between in-school and out-of-school instruction in addition to careful consideration by educators for how to create quality education while addressing the community's demonstrated needs. Three basic steps are proposed to support the insurance of our students being able to access quality education in the midst of an untraditional school year for 2020-21 without requiring major modification of curriculum or extra financing from the school district or teachers. Google Classroom is the main platform focused on for the purposes of this article as it is [free to all K-12, government-recognized, non-profit schools](#) and offers the ability to integrate with numerous platforms, decreasing the number of independent accounts required by students.

Step 1: Gather Real Data from Students

To create a meaningful and authentic teaching model for students, it is essential to know, without assumption, which aspects of technology access inequity are necessary to address: computer access, stable internet connection, or working knowledge of how to navigate technology (email, calendars, word processors, etc.). [Before creating an instructional plan](#), teachers must be aware of the level of access their students have within each of these aspects.

Questions to Ask Students:

Distance learning leans heavily on an individualized approach as each task or material distributed must be accessible for all students. The following questions provide student details regarding access and digital literacy. While questions related to students' home lives can draw out concerns of privacy, ascertaining students' ability to access distance learning is paramount. Information gathered from students regarding their access should be kept private and only shared with those who will need to have the information in order to assist the student and family in becoming digitally connected.

1. [What is the best number to reach you or your family? Do you or your family have a preferred language for communication?](#)

Purpose: When planning for distance learning, communication with students and their families are essential, especially through channels that do not require internet access. Clarifying up-to-date contact information for the student and their family is helpful for tracking student engagement as it can be tracked to quantify family communication throughout distance learning. This question guarantees that teachers have the most up to date in addition to establishing potential translation needs. [TalkingPoints](#) is a free app for teachers that allows them to translate text messages into other languages.

2. [Do you have access to a computer \(laptop, desktop\) or tablet at home? If yes, how many?](#)

Purpose: Computers, either desktop or laptop, are preferential for student use as tablet software occasionally restricts the functionality of sites if that site has not created an application or extension specific for tablet use. Knowing the number of potential devices in the home will also be helpful in understanding the student's ability to have access to a device as needed or if they have to share.

3. Do you have access to a smart phone? Are data limits an issue?

Purpose: Educational platforms like Google Classroom have applications available for download that allow students to see, complete, and remind students of assignments. Some types of assignments can be completed on a phone without a decrease in functionality, while other mobile applications do not offer equivalent experiences between a mobile device (phones, tablets) compared to computers (desktops, laptops).

4. Do you have Wi-Fi at home?

Purpose: It is necessary to understand the percentage of students with access to the internet via data plans versus those with Wi-Fi. Data plans, while helpful, are not full replacements of Wi-Fi as they do not necessarily allow hotspot use and even if hotspots are enabled, there may be data caps specific to this use.

5. How many people are in your home that also need to use the computer or tablet (siblings, parents, etc.)?

Purpose: If there are multiple people in the child's home that also require the use of a device, the student cannot be expected to have unlimited access to the computer as needed. In addition to this, even if multiple devices are available in the home, the increased number of individuals accessing the internet may interfere with the speed of connection for the student's device.

6. Are you and another person able to watch videos or stream content (Netflix, YouTube, music streaming services, etc.) at the same time?

Purpose: Streaming content and watching videos are high-bandwidth activities. If a student and another person can do these types of activities simultaneously, then the student most likely has access to a reliable internet connection that will allow them to participate in video conferencing, video-led instruction, simulation websites, etc.

7. How would you rate your ability to do the following on a scale from 1 to 5 (5 meaning that you are confident in your ability):

- a. Upload/download a file?
- b. Use calendar invitations?
- c. Search your email?
- d. Attach a file to your email?
- e. Change the formatting in Google Docs or Microsoft Word?
- f. Make a graph in Google Sheets or Microsoft Excel?
- g. Make a PowerPoint using Google Slides or PowerPoint?
- h. How comfortable are you using a computer for school projects such as a research paper?

Purpose: Understanding what students are feeling in regard to their technological literacy is a good marker for the level of support each student will require to obtain their deserved

education. Distance learning requires students to have literacy in using technology that they may or may not have had the access to develop depending on their primary education. Even if all students have access to computers and the internet, if they have not developed a working understanding of technology, an instructional plan utilizing advanced online learning platforms may not be effective.

Where are You? Where are the Students?

When accumulating student data, reflect on your own access as an educator. Do you have the internet speed and the technology to carry out popular high-bandwidth teaching strategies such as video conferencing, creating, and uploading video lectures, utilizing educational software allowing for real-time student feedback and monitoring? Teachers' connectivity and comfort with integrating technology into curriculum is a necessary component in reflection when building a hybrid model as you will be called on to be designers, troubleshooters, and experts in the educational technology used by your students.

Lastly, after collecting this data, it is important to reflect on the results as more than mere percentages. Who are the students without access to computers or reliable internet access? Who is confident in their technology literacy? Do students deserving receiving IEP, 504, or English Language services have technology access? Specific identification of student needs coupled with reflection for who will be left out by implementation decisions for distance learning is required before structuring class-wide routines and individual supports for students.

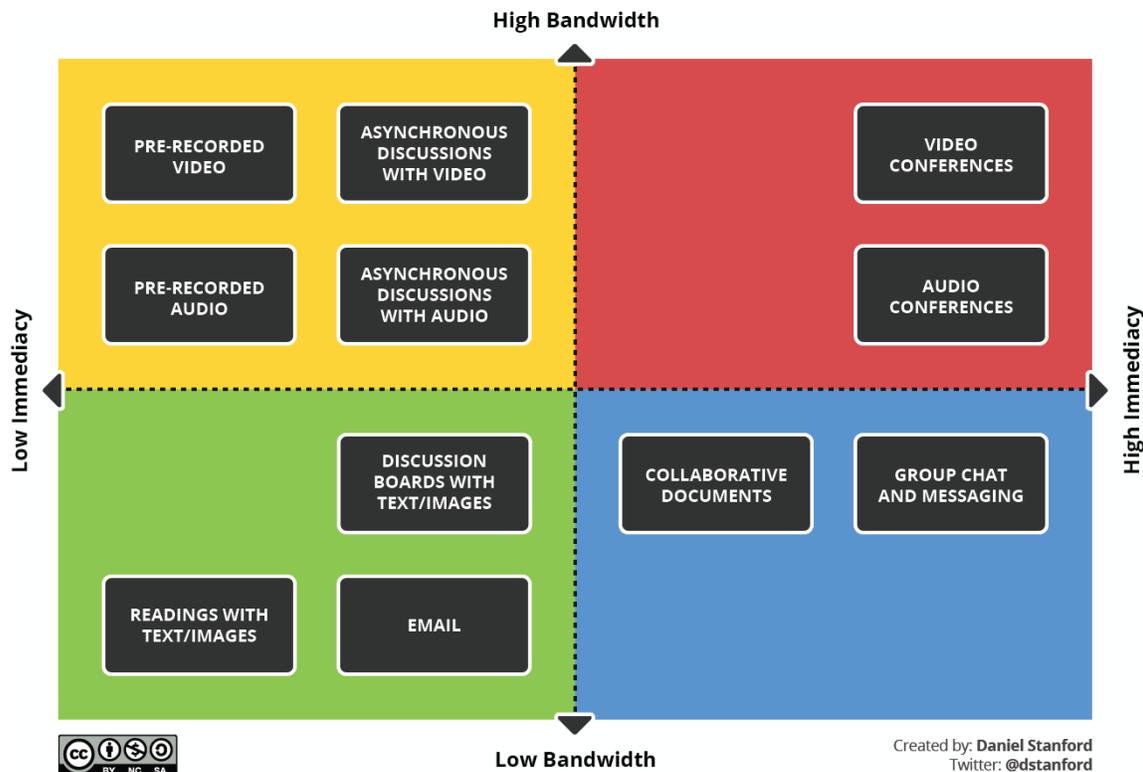
Step 2: Create Low-Bandwidth Teaching Plan

Education should always be delivered at the highest quality possible. If students and teachers have the access to technology required for the most successful and engaging distance learning tactics, such as small group work in Zoom breakout rooms, then these should be used. Creating a Low-Bandwidth Plan for students can be individually constructed for a narrow group of students or used class-wide depending on the variability of technology access. Low-bandwidth strategies represent a specific response to actual need, with the most engaging and productive form of distance learning always pursued.

Understanding Bandwidth of Learning Platforms

All distance learning platforms have some amount of bandwidth required for internet access as bandwidth refers to the amount of information that is able to be transferred at one time, expressed

in bits per second. The more bandwidth, the faster the internet connection and the higher the capacity for multiple users. [Just as pipe size regulates water flow in plumbing](#), bandwidth regulates internet speeds and capabilities.



Daniel Stanford of DePaul University outlined the two key factors necessary to consider when planning online instruction: [bandwidth and immediacy](#), where immediacy “refers to how quickly we expect our students to respond.” To demonstrate the broad range of options that teachers have in the intersection between bandwidth and immediacy, Stanford created the above matrix that is helpful for teachers to visualize methods of instruction outside of high-bandwidth demanding activities. Streaming video content; i.e. watching YouTube, Netflix, Zoom, etc., requires a considerable amount of bandwidth. When we ask our students to learn through instructional videos or attending video conferencing online classes, we are assuming that they have the necessary bandwidth to accommodate this, and that this is true regardless of any other individuals in the household that also require use of the internet.

Examples of Low-Bandwidth Teaching Strategies

Converting curriculum into distance learning materials is more complicated than simply turning each lesson into a virtual duplicate. The ways in which students are engaged and supported are

different between in-person and distance learning environments. As many teachers saw in March, student engagement in distance learning through discussions, classwork, and note taking requires modification so that the students' voices are brought into the space. Distance learning includes two general categories: real-time instruction and independent student learning.

Reconciling with the fact that distance learning creates specific barriers for students who receive school services for English language development, IEP, or 504 plans; teachers must create direct instruction with the continuation of these supports. Using a complete "flipped-model" approach to teaching in which students are expected to complete direct instruction separate from the teacher thus coming to class prepared to apply learning may not allow for adequate provision of scaffolded support as students are building the base of their topic understanding. The ability to provide graphic organizers, reference sheets, sentence starters, process flow-charts, etc. should drive the selection of direct instruction methods and decide the percentage of independent student learning expected of classes.

The following examples present a handful of strategies for teachers to differentiate distance learning on the basis of technology access for student learning with and without teacher presence.

Video Conferencing for Class-Wide Instruction

A go-to for many teachers in distance learning has been video conferencing software. The same software may be made more low-bandwidth friendly if certain features are enabled and students have access to copies of the slides or documents used. As many of these examples hinge on coupling meeting

- Lower Bandwidth of Video Meetings

Bandwidth is [reduced](#) for video meetings by 1) having fewer people per meeting, 2) decreasing video quality, 3) turning off participant video feeds, and 4) limiting screen sharing.

As host, teachers are able to turn off participant video, audio, and control who is able to share screens which lessen the amount of data required by each individual in the meeting. Teachers may also [turn off HD video](#) for Zoom meetings under settings, while Google Meet [defaults](#) users' video to the lowest quality. The more people in attendance, the more bandwidth is required for all participants, even when video is disengaged. Sharing screens is a great tool to lead a class but can be replaced by collaborative documents which require less bandwidth for all users.

- Enable Participant Call-in Features

For both Google Meets and Zoom, students are able to call into meetings without internet access when enabled by hosts in the meeting settings. Click here for information about how to do this on [Google Meet](#) and [Zoom](#).

- Integrate Interactive Classwork

Using Google Docs, Slides, and Sheets in class instruction creates a platform for student participation and leadership without requiring the high bandwidth of video or audio. Coupling the use of these documents through the sharing of links through Google Classroom along with information for students to access virtual class meetings by calling-in, the requirement for bandwidth is dramatically lessened.

Utilizing Google Drive allows teachers to upload Microsoft documents and convert them to the Google equivalent. With this ability, it may be possible to reuse past content by converting a classwork sheet into a virtual platform which lessens the teaching transition to distance learning. Assigning students responsibilities of answering to specific questions, explaining a peer's work, or offering a different approach or opinion for a question are examples of how collaborative documents can be used in direct instruction to diversify note-taking and replace lectures.

An [MIT instructor](#) lowered bandwidth requirements for his lectures in distance learning by sharing a link to a [whiteboard app](#) and enabling call-in for Zoom meetings so that all students could hear and ask questions while viewing the virtual whiteboard. You are able to add to the whiteboard through text; however, this is most productive if the teacher has access to a tablet.

Independent Student Learning

While videos and recorded lectures are helpful, relying on these as the primary source of direct instruction in distance learning creates inequality for students who do not have consistent access to reliable internet and devices, and present barriers for teachers without reliable connections for uploading. Additionally, video material may restrict students from receiving proper support specified by IEPs or English Language services. Positioning instruction surrounding documents rather than video enables scaffolds to be directly incorporated through graphic organizers, vocabulary lists, note-taking guides, etc.

- Scaffolded Readings

Active reading activities that prompt students to process the information presented are beneficial in student learning. When used in conjunction with real-time direct instruction from teachers, students build a repertoire of learning that accommodates varying individual strengths as students are able to interact with the same content through multiple access points of reading, writing, and listening. As readings are commonly structured in classes, previous years' materials are able to be used. Formatting reading activities as a Google Document or PDF lowers bandwidth required from students. Students can record and submit answers directly through the collaborative document which when submitted through Google Classroom, enables the teacher to provide direct feedback for the

assignment. For students with significant bandwidth limitations, reading assignments sent as PDFs require the least bandwidth. In response to PDF documents, pictures may be uploaded or sent directly to the teacher for feedback.

- Independent Research of Topic

In place of students note taking from a teacher-prepared reading or video, asking students to complete their own research of vocabulary and processes for a content topic. This allows students the flexibility to create their initial understanding on any connected device, including phones. Additionally, independent research is well structured to engage students in real-time instruction as they have time to prepare before sharing out. Sharing in-class may be done verbally, which is inclusive for students who require calling-in to video meetings, through chat features of online meetings, or may be done through collaborative documents like Google Slides or Docs. Google Classroom also enables students to submit answers to questions posted by teachers under the Classwork tab.

- Student Lab Kits and References

If your school district is able to, sending physical resources to students is beneficial, especially if distance learning will be an extended time period. Resources such as equation sheets, graphic organizers, thinking processes, models, vocabulary lists, or simple tools like calculators and thermometers are helpful for repeated types of assignments of subject areas. For science classes specifically, ensuring students have access to common household materials enables students to perform simple experiments that provide hands-on aspects of learning typically seen in the classroom. Resource sheets provide a way teachers can target support to students with specific learning disorders or primary languages other than English throughout distance learning.

Assessing Student Mastery

Although live monitoring of quizzes and exams is enabled through some educational software, distance learning offers the opportunity to rethink how we monitor for mastery outside the confines of traditional instruction. Embracing the resources that students have access to, including each other, rubric based assignments allow teachers to track progress of content knowledge while focusing on the application of understanding.

- Reformatting Homework

Assigning homework using Google Forms or Docs accommodates those with low-bandwidth, while still providing the opportunity for teacher feedback that is not possible with printed copies in distance learning. Google Forms works well on both phones and computers and contains various questioning formats such as multiple-choice, open-response, table, and file uploads. Forms should be used when students are to complete the assignment in one-sitting as they are not permitted to save and continue work at

another time. Teachers can prepare feedback for answers so that student work is automatically graded and coupled with explanations. Homework as a Google Doc offers a natural student collaboration document or acts as an individual assignment that students can return to multiple times.

- Project-Based Mastery

Rather than students taking an exam or a quiz over a topic, asking students to analyze additional data, articles, or charts to explain connections with content standard; design a prompt or problem for their peers; and create presentations of an exemplar response lowers bandwidth needed for exam software without lowering the quality of their mastery. Google Docs, Slides, and Sheets integrate with each other for students to present their analysis to the class or turn in a document to the teacher. Docs, Slides, and Sheets also provide offline access to a user. Spinning the constraints of distance learning into assets, activities such as these allow students to grow their technological literacy and skill sets for college and career readiness where exams cannot in addition to positioning them as leaders in the class.

Bandwidth of Common, Free Educational Platforms

Low Bandwidth Platforms

[Google Classroom](#)

Features:

- Compatible with many online education platforms
- Integrates with all other [Google Suite](#) products including Gmail, Calendar, Docs, Sheets, Forms, Slides, Meet, YouTube, and more
- Organizes class announcements, assignments, and materials
- Built in grading management system, including autograding on quiz assignments
- Ability to add parents of students who will receive weekly summary of all of child's Google Classroom assignments and materials
- Automatically saves all materials and assignments posted to the classroom's Google Drive
- Email notifications for students when materials posted, all posts saved under Stream tab in Google Classroom, able to serve as a class email list-serve

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- Ability to create assignments with teacher-owned documents shared with students to view or edit
 - Ability to create assignments with Google Docs, Slides, or Sheets individually owned by students
 - App available on smartphones

Tips to Lower Bandwidth:

- Post links to videos rather than uploading the content as a file
- Post PDF assignments in place of collaborative document assignments

[Google Docs, Sheets, Slides](#)

Features:

- Automatically updates and saves to Google Drive
- Create free presentations, documents, and spreadsheets from scratch or from templates
- Tracks changes by students and teachers, able to revert to past versions
- Able to edit Microsoft PowerPoints, Word, or Excel documents online with and without converting to the Google version
- App available on smartphones
- Available for offline editing**

[**How to Access Docs, Sheets, and Slides Offline:](#)

- Requires Google Suite administrator (teacher to school administrator) to enable offline access
- Student downloads Google Offline extension
- Student turns on offline access for their drive
- Student makes individual files available to be edited offline

Tips to Lower Bandwidth:

- Do not include video, audio data

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- Limit live-updating connections to other Google Products
 - Slides: Limit the use of animations
 - Sheets: Decrease data entries, limit the use of live-updating graphs

Google Forms

Features:

- Create quizzes or surveys with various types of question/answer types, organize questions by section
- Automatic grading when created as a Google Classroom Assignment, grades automatically imported into Classroom
- Teachers can add different feedback for correct and incorrect answers
- May be returned immediately or manually
- Ability to lock Chromebooks from viewing other windows
- Able to shuffle order of questions and answer choices
- Automatically generates analytics of responses, able to export response data to sheets
- Ability to include videos, pictures, and audio media
- Ability to add response validation
- App available on smartphones
- Students able to easily complete on smartphone

Tips to Lower Bandwidth:

- Limit video and audio content
- Choose the least interactive question types
- Post as PDF on Google Classroom

Moderate to High Bandwidth Platforms

CK-12

Features:

- Able to post materials and assignments directly to Google Classroom
- Variety of content available: videos, simulations, articles, interactive “Flexbooks” for Humanities and STEM subjects
- Teachers can add/create content in addition to editing articles and Flexbook chapters
- Built in adaptive practice sections within Flexbook 2.0
- Ability to create quizzes from pre-made question pools for each topic of a subject
- Flexbooks are easily translated into various languages
- Free professional development webinars for teachers

Tips to Lower Bandwidth:

- Post PDFs of quizzes, practice sets to Google Classroom rather than students completing the online versions
- Choose articles rather than Flexbook chapters so video content is excluded
- Download Flexbook as a PDF and post either as full textbook, or by chapter to Google Classroom

[EduLastic](#)

Features:

- Syncs with Google Classroom, able to post assignments directly to Google Classroom
- Ability to create question using 30+ technology enhanced types
- Assessment tool with real-time monitoring of student progress
- Pool of standard-aligned questions for Humanities and STEM subjects
- Built in student calculator for numeric answers, more advanced calculators available depending on question type
- Teacher can create assessment from preexisting PDF
- App available on smartphones

Tips to Lower Bandwidth:

- Post PDF version of assessments on Google Classroom
- Choose less interactive question types (i.e. multiple choice, checkbox, or free response instead of graphing, matching, or sorting)

[Khan Academy](#)

Features:

- Syncs with Google Classroom, able to post materials and assignments directly to Google Classroom
- Offers video lectures, example problem explanations, interactive practice problems, and textbook-like articles for various Humanities, STEM, and test prep subjects
- Groups videos, practice, and articles by topic for each content area
- Offers resources for students, parents, and teachers

Tips to Lower Bandwidth:

- Assign articles in place of video lectures

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- Post PDF version of materials on Google Classroom

High Bandwidth Platforms

Google Meet

Features:

- Integrates with Google Classroom, displays Meet link on Classroom home page**
- Allows teachers to mute all participants
- Teacher is able to share screens
- Participants may call in
- Built in chat function
- Ability to remove participants, must be approved by teacher to reenter
- Defaults to lower quality to limit bandwidth

**Students are currently able to initiate calls without a teacher when the Meet link is displayed on Google Classroom home page. To avoid this, the teacher should only [turn on the link display](#) immediately before class meeting times.

Tips to Lower Bandwidth:

- Ask students to turn off video and to mute themselves
- Ask students to call-in instead of attending the online meeting
- Limit use of screen share

Zoom

Features:

- Allows teachers to control audio, video, chat, and screen sharing settings for all students during meetings**
- Password encryption available
- Teacher is able to share screens, use virtual whiteboard, and connect to tablets and phones via cable or Bluetooth

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- Participants may call in, must be enabled by teacher
 - Built in chat function
 - Ability to remove participants, must be approved by teacher to reenter
 - Advanced account upgrades available for pay

**Free accounts (Basic) are typically limited to 100 participants for 40 minutes. In response to COVID-19, [Zoom lifted these limits](#).

Tips to Lower Bandwidth:

- Ask students to turn off video and to mute themselves
- Ask students to call-in instead of attending the online meeting
- Limit use of screen share

Distance Learning Resources for Teachers

Articles for Teachers in Distance Learning

Sources for Updated Articles

- [Edutopia](#)
- [Rural Resource Hub](#)

Individual Articles

- [How to Improve Distance Learning for Students With IEPs](#)
- [Tips for Tech-Limited Classrooms - Google](#)
- [Set up Google Meet for distance learning - G Suite Admin Help](#)
- [Reopening Schools during COVID-19 Pandemic](#)

Additional Free Education Platforms

- [CommonLit](#)
- [DeltaMath](#)
- [EdPuzzle](#)

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- [PhET](#)
 - [70+ Awesome Apps that Integrate with Google Classroom](#)
 - [18 Amazing Free Sites and Apps to Use With Google Classroom](#)

Step 3: Advocate for Students and Families

Internet Resources for Families

Connectivity during COVID-19

Although companies and organizations alike are taking action to support communities across the U.S., be aware of predatory actions through programs that offer free services for temporary time periods.

- [Internet Guide during COVID-19 Pandemic:](#) Includes information on companies providing temporary fee waivers for internet connectivity, or discounted rates, in addition to links that help people determine appropriate internet speeds.
- [How to Find Free Wi-Fi Hotspots:](#) Article providing built-in search bars based on zip code for free hotspots available by participants of the Keep Americans Connected Pledge. Further information is also provided on types of hotspots and tips to find/use hotspots.
- [Keep Americans Connected Pledge:](#) More than 800 companies have signed a pledge stating that they will not terminate internet access due to lack of payment for the duration of the pandemic. Hotspots of the companies are available to the public, free of cost.

Gaining Internet Access outside of Pandemic

- [Internet Assistive Programs:](#) Programs available year-round, both by independent companies and federal assistant organizations. These programs are not related to COVID-19 relief and should be available after the pandemic specific supports are lifted.
- [HighSpeedInternet.com:](#) Simplified search tool that populates options for individuals or companies based on zip code. Users are able to compare providers, see information for available plans by providers, and learn about the different types of internet connections.

School Leaders and Districts

Gathering real data from students enables you as a teacher to authentically advocate for the needs of the school community. As Google Classroom and other online education platforms continue to expand, distance learning is becoming integrated into general instruction which marks an exceptional shift towards connected devices being a utility at home long after the pandemic subsides. Educational disparities of communities which are rural or low-income will increase without intervention by teachers, school districts, and communities in advocating for technology access equity.

Recommendations to Address COVID-19 Pandemic

Specific to the COVID-19 pandemic, there are specific areas of advocacy needed by teachers during distance learning:

- School-wide collection of data from students through questions listed in Step 1
- Tracking of family communication, including active outreach to students and families who are “offline” between time in school
- School-wide consistent online meeting schedules during full or part-time distance learning
- Family surveys when deciding how learning will happen (hybrid, blended, full-time online, full-time in school)
- Implications of hybrid model, if chosen, must prioritize the health of community and require action in response to technology access inequity as reported in student data
- Potential rebudgeting of funds during distributed to out of school needs of students (spending on Chromebooks instead of printer/copier materials or teacher supplies)
- Application for federal relief [funding through CARES Act](#) to be put towards technology needs of students, including equipment for creating hotspots
- Physical material distribution to families and students, specifically for students who receive services through IEPs, 504, or English Language support.

Advocating for Technology Access for General Instruction

- [Classroom connectivity speeds](#) of 100 kbps per student for basic use integration of online technology, 1 Mbps per student for everyday use of connected devices in every classroom
- Chromebook access in-school, narrowing ratio of Chromebooks to students to one-to-one

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- Applying for federal education funding through [E-Rate, ESEA, and state grant opportunities](#) specifically for internet and devices

Local, State, and Federal Representatives

Technology access is well suited for holistic solutions as it affects access to healthcare, education, and job opportunities. Creative solutions have been implemented by local governments since the coronavirus pandemic erupted in the U.S. to address the inequity in connectivity and devices.**

- [Hamilton Co. Schools, EPB announce "digital connectivity initiative" for kids in need](#)
- [S.A. to leverage traffic lights to expand fiber network for students](#)
- [Poughkeepsie Wi-Fi Project](#)

**Children's cabinets are active in these communities listed above which have contributed in their ability to rally around student and family needs. If you are interested in learning more about the nonprofit Local Children's Cabinet Network which helps establish this model for local governments, click [here](#).

This piece was written by Amy LoBue, Leadership in Education Equity Fellow at the Education Redesign Lab of the Harvard Graduate School of Education. It was last updated on August 6, 2020.