

From Surviving to Thriving: Reimagining Learning During the COVID-19 Crisis

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Welcome

This guidebook is intended to be a resource for educators and school leaders looking to design and implement a successful hybrid or remote learning experience in a K-12 learning environment.

What we cover:

- Building blocks for establishing and implementing a successful hybrid or remote learning program
- Best practices and strategies for designing meaningful digital learning experiences
- Technology tools to facilitate engaging activities and lessons in a digital environment
- Reimagining assessment in the current situation
- Technology tools for implementing formative assessments



Before we begin...

Throughout the guidebook, we use the terms hybrid and remote learning. These terms should be seen as broad concepts that encompass a wide range of school situations. Below are simple definitions to help clarify.

Hybrid (or blended) learning includes both in-person and online learning in an integrated learning experience. For more information on blended learning, check out <u>Blended Learning Universe</u> from the Clayton Christensen Institute.

Remote (or distance) learning occurs entirely in a virtual learning environment, usually combining both asynchronous and synchronous (live) experiences.



Guiding Question

Instead of attempting to recreate the physical classroom, why not view the current situation as an opportunity to reimagine and rethink the learning experience. Consider the following: **How might we use hybrid and remote**learning as an opportunity to transform teaching and learning?



Before we begin designing digital learning experiences, it is important to consider the building blocks and foundations that will set students and teachers up for success. In this section, we ask critical questions about access and infrastructure, emphasize the importance of establishing a common culture and vision, discuss the critical nature of relationships, introduce the concept of immediacy as a limited resource in scheduling, and illustrate the value of quality professional learning in meaningful technology integration.

Infrastructure and access

To begin, schools must answer questions of what infrastructure and access students and teachers need to participate in digital learning experiences.

Some technological considerations include:

- Internet. Do students and teachers have access to the Internet? What is the reliability and strength of the Internet? Who else in the household is also at home utilizing the Internet, and how might that impact performance? Are they able to participate in low-bandwidth and/or high-bandwidth activities?
- Hardware. Do students and teachers have access to mobile devices or school-issued laptops? Do they need additional equipment such as cameras or keyboards?
- **Software.** Do students and teachers have access to the programs or software needed to successfully complete coursework/instruction? Are there additional considerations or costs associated with accessing any of these software programs? Do students and teachers know how to use the required tools? If they do not have prior experience using them in a physical classroom environment, have they received professional development/training and access to support?

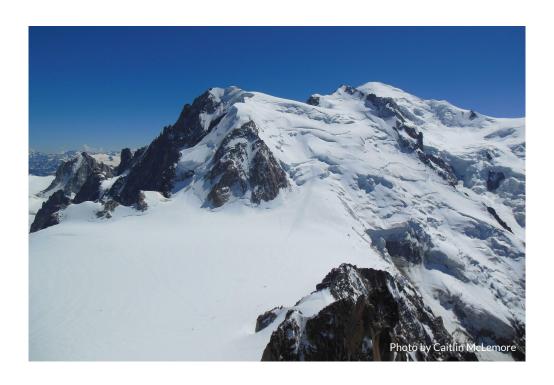
Schools also need to consider what additional materials and resources students may or may not have access to outside of the physical classroom. For example, not all students will have access to materials commonly found in the classroom such as arts and crafts supplies. For any of these questions, if the answer is no (or uncertain), schools must try to provide access and support to families when possible. Additionally, teachers should be mindful of students' unique situations, particularly during this challenging time, and provide alternative pathways to success.



Establishing a common culture and vision

As schools prepare for the upcoming school year, they will need to generate plans that consider hybrid and remote learning options. Even in such unprecedented times, establishing a common culture and vision is critical. Without a clear vision, schools will not be able to envision what teaching and learning will look like, whatever the scenario. How can schools plan for the future without knowing what it is they are hoping to accomplish?

With the future being so uncertain, schools will need to think through multiple options for providing an education to students and helping teachers fulfill their roles as educators. While schools, including students and teachers, might long for classrooms to return to normal, that "normal" is not realistic (or safe) at this point. As such, schools should be prepared for a variety of situations: physical distancing in school settings, remote learning environments, or hybrid learning options. Even if schools open for in-person classes, they should be prepared to support students and teachers that choose (or need) to be learning remotely for extended time periods.





Relationships are critical

Student-teacher relationships

Connection with others is "a fundamental human need" (Harvard Graduate School of Education, 2020). Regardless of location or situation, the student-teacher relationship is foundational to learning. Yet, developing authentic relationships online can be challenging, as many students and teachers discovered in the spring with the sudden transition to remote learning. This upcoming fall, classes may begin remotely, with no prior opportunities for face-to-face interactions.

How can we make students and teachers feel comfortable in this environment? The challenge is daunting, but establishing a positive community is a critical component of online learning (O'Keefe, Rafferty, Gunder, & Vignare, 2020). With remote learning, students should have opportunities to interact with other students and their teachers in non-graded experiences. For example, a classroom teacher might provide an online discussion thread for fun topics. Or, a school librarian might host an esports league for students to join. Building relationships should be a deliberate component of online learning environments that educators actively work to infuse within the virtual classroom space.

In addition to building relationships, schools should provide opportunities for students to connect with an adult for support outside of regular classroom interactions. Some options schools could consider: an advisory program that connects students in small groups with an adult on a regular basis, a 'teacher-on-call' option for students needing supporting in completing academic tasks, or looping so that students and teachers who have previously established relationships can continue working together (Reich & Mehta, 2020b).

School-family relationships

Now that much of learning is happening outside of the school building, families are more involved in their children's learning experience than ever before. In the spring, families spent hours each day supporting one or more school-aged children in their home, likely while they also managed other caretaking responsibilities and working from home.



Schools should ask:

- How might we utilize community and family members to help support learners?
- How might we support families in the home learning experience?
- How might we use technology to facilitate communication and connections between families and schools? If there are challenges in reaching students' families, how do schools ensure that students' needs are being met?

With long-term hybrid and remote learning, learning will need to be a community effort. Schools and teachers should plan for increased communication, not just around attendance and grading, but as a two-way experience that supports student learning.

When scheduling, schools and teachers should be accommodating and mindful of potential challenges and constraints within a hybrid or remote learning environment. Students might have connectivity issues with multiple family members on WiFi at the same time, or they may not be on camera because they do not feel comfortable sharing their home learning space. Consider leaving the decision up to students on whether or not they turn on their cameras (Lindsey, 2020).

Making the most of time

Immediacy is a limited resource (Stanford, 2020). With remote learning environments, 'Zoom fatigue' is real (Fosslein & Duffy, 2020). Students and teachers cannot be expected to be engaged in video conferencing sessions all day long. As such, schools and teachers should consider the following questions:

- How can we make the most of synchronous sessions?
- What are some of the benefits of asynchronous learning?





In answering both questions, think about how technology can help students and teachers go beyond what is possible in a face-to-face class. With synchronous sessions online, how can connectivity help to enhance or extend learning? With asynchronous sessions, students and teachers interact with content and each other at different times, increasing flexibility and opportunity for engagement. Asynchronous learning accommodates different learning styles, schedules, and encourages reluctant or quiet students to participate.

When scheduling, schools and teachers should be accommodating and mindful of potential challenges and constraints within a hybrid or remote learning environment. Students might have connectivity issues with multiple family members on WiFi at the same time, or they may not be on camera because they do not feel comfortable sharing their home learning space. Consider leaving the decision up to students on whether or not they turn on their cameras (Lindsey, 2020).

Quality professional learning

Educators need to think about how they can be adaptive and modular in the planning process (Reich & Mehta, 2020a). However, educators cannot do this alone. Schools need to support educators with professional learning opportunities that establish best practices for hybrid and remote learning, as well as for meaningful learning with technology (Jonassen, Howland, Marra, & Crismond, 2008). It is not just about learning how to use the tool, but how to best use a tool to achieve learning goals and outcomes.

Professional learning through EdTechTeacher

The EdTechTeacher mission is to help educators to support their quest to enrich student learning experiences through emerging technologies and innovative models of classroom instruction. Our Instructors are experienced educators who focus on empowering teachers to empower students. We offer multiple avenues for meaningful professional learning experiences including customized training, learning events, and virtual offerings. For more information about our current offerings, visit our website.



Regardless of plan details, the upcoming school year will likely include some form of hybrid or remote learning. As such, students and teachers will spend some (or most) of their time in online learning environments. We hope this section provides educators with guidance on how to design meaningful digital experiences for their students.

Student-teacher roles

The student-teacher relationship is foundational to learning in any environment whether hybrid, in-person, or remote. Even so, the roles and responsibilities of students and teachers shift in online learning environments.

Teachers

Teachers use technology to:

- Be present for students in both live sessions and asynchronous learning. Presence in a virtual space means providing meaningful and regular student feedback, as well as communicating with students in ways that allow them to see and hear their teacher.
- Empower and support students as independent learners. Provide student choice and voice as much as possible. This will reduce fear and uncertainty, and help students to take control of their learning.
- Engage students in active learning experiences. Keep students engaged and interested in learning by interspersing activities and content delivery. Consider designing micro-lectures to limit the amount of time students spend watching instructional videos (O'Keefe, Rafferty, Gunder, & Vignare, 2020).







Students

- Working online will require students to be more independent. Not all students will have family support during the school day.
- Student choice and motivation will drive their investment and success in online learning (Petrilli, 2020). This does not mean all responsibility rests on the student, rather, teachers should support student learning by facilitating student choice and voice whenever possible.
- Students need teachers to be understanding and recognize the unique challenges of learning remotely during a global pandemic. "Students' ability to successfully learn during a pandemic, especially if they are new to the online environment or experiencing unexpected stressors, should be taken into consideration" (O'Keefe, Rafferty, Gunder, & Vignare, 2020, p. 9).



The International Society for Technology in Education (ISTE) published <u>Standards for Educators</u> and <u>Standards for Students</u> that help students succeed as digital learners and help teachers design student-centered learning experiences. Consider using the ISTE Standards as a roadmap for designing digital experiences.



Curriculum design

In an online learning environment, the cognitive workload is often greater than that of a physical classroom. With this in mind, *less is more* regarding content. Educators should not try to stuff content into an already packed schedule. Consider the idea of Marie Kondo-ing the curriculum, or identifying key topics that "spark joy" (Mehta & Peeples, 2020). What are the essential topics within a subject? Be realistic about expectations, and think about both what content can be recreated online, but also what new opportunities exist with hybrid and remote learning to rethink the curriculum.

The brain can only take in so much information at a time. Consider the cognitive workload within your class and also consider a student's total workload. Beyond even what students are expected to do for school, consider what external factors are weighing on students, parents, and educators.



Backward design

How do educators implement a less-is-more strategy toward curriculum design? The Understanding by Design framework (McTighe & Wiggins, 2012) offers an approach to designing curriculum, assessment, and instruction that focus on student learning outcomes. Rather than coming up with a lesson plan first, then designing assessments or matching learning objectives to the lesson, begin with the end goal in mind. What are the learning goals and objectives? In other words, what do we want students to know and understand?

After choosing learning goals, it is helpful for students if educators are clear and explicit about desired outcomes. This is an especially important point with a pared-down curriculum. Students want to know why a particular activity is relevant to their learning.

Independent student learning

With hybrid and remote learning environments, students will need to be more independent as a classroom teacher (or family member) will not always be available to help them navigate course content. As such, educators need to make accessing course content clear and simple. Not all students will have the same level of at-home support, so educators should support students in independent course navigation as much as possible. Furthermore, incorporating student choice and voice as much as possible helps ensure fidelity in student work.

Some instructional design strategies for educators:

- Limit the number of information sources. Try to create a single landing page where students and families can get all relevant information for completing assignments and interacting with instructional content.
- Develop equitable, high-quality, interactive, multimedia content. As educators manage increasingly complex demands on their time, creating quality content will be challenging. However, not all instructional content needs to be original. Educators should consider utilizing open educational resources (OER).



Open Educational Resources (OER)

What is OER? "... freely accessible, openly licensed text, media, and other digital assets that are useful for teaching, learning, and assessing as well as for research purposes" (Wikipedia, 2020).

Some OER resources for getting started:

- Open Educational Resources [ISTE]
- Making Connections: PreK-12 OER in Practice [New America]
- <u>K-12 Remote Learning</u> [OER Commons]
- Make instructions clear and easy to understand. Use consistent color and design to help guide students. When needed, make it clear to students that they need to click on external links (e.g., include a "computer pointer finger" icon) to complete assignments.
- Include redundancy when possible. The more opportunities that students have to engage with content, or access instructions, the better. As students may be navigating online learning environments independently, redundancy provides built-in support.
- Make strategies for problem-solving explicit. Even with clear guidelines, a single landing page, and redundant instructions, students will encounter challenges and have questions when learning online. In these situations, rather than floundering or shutting down, students should know what problem-solving strategies to employ. They should also know when and where to reach out for help. At the beginning of the school year, communicate problem-solving strategies and options for support, so they are ready when the time comes to utilize such resources. With younger students, they can ask "What can I do?" and "Who can I ask for help?" This might be a live discussion with students, an asynchronous lesson with activities, or posting resources to a class page.
- Utilize the Universal Design for Learning (UDL) framework (CAST, 2018). UDL guidelines help teachers design learning experiences that allow all students to access and participate. The framework focuses on facilitating student engagement, representation, and expression.



Communicating with students

Communication online can be synchronous (live) or asynchronous. While schools and districts may determine the exact schedule within a hybrid or remote learning environment, teachers should be mindful of which activities are better for asynchronous or synchronous communication (Young, 2020).

Teachers need to communicate the learning plan including daily objectives and long-term goals. For elementary school students, provide a daily to-do list, but also a week-at-a-glance schedule. For high school students, the schedule might be longer-term, such as an overview of an entire unit.

Digital learning experiences provide increased differentiation and flexibility (e.g., through multimodal content, pacing). With this in mind, teachers should carefully consider the balance between structure and choice. Whatever the balance between autonomy and structure, students and families need clear and consistent communication. The following tools will help facilitate learning online for both in-person and remote learning students.

A learning management system (LMS) can serve as a landing page for courses. Within an LMS, each course has its own space for communicating with students, delivering content, grading assessments, providing feedback, and sharing information. Students and teachers can access and participate in classroom activities. Teachers should provide clear, explicit instructions on how to navigate their courses online. Just because students are often frequent technology users does not mean they are fluent in all tools.

A wide range of LMS exists, from the free Google Classroom to paid programs (e.g., Blackboard, Brightspace, Canvas, PowerSchool, Schoology) that integrate with student information systems (SIS). Most of the tools we describe later in the guidebook can be easily integrated into Google Classroom and other LMS.



Google Classroom



While Google Classroom does not have the full functionality of a traditional LMS, it is a popular choice for schools because it is free and integrates with other G Suite for Education tools. As such, Google Classroom becomes an easy-to-access online classroom space with features such as posting announcements, creating and sharing assignments, grading student work, providing feedback, rubrics, student discussions, and more.

A simple but powerful tool, Google Classroom helps to streamline the file-sharing process, serves as a single location for classroom activities, and improves workflow management. Google Classroom can also leverage the collaborative features of other Google tools such as Docs and Slides. Google Classroom facilitates communication between students and teachers through commenting, integrated rubrics, and direct teacher feedback.

Check out these Google Classroom resources:

- <u>EdTechTeacher: Google Classroom</u> [Basic information, blog posts, tutorial videos]
- <u>Google Classroom Tutorials</u> [YouTube playlist from Google for Education]
- Manage teaching and learning with Classroom [Google help center]
- The Complete Guide to Google Classroom [Digital book by Ben Sondgeroth]

Other LMS

A plethora of LMS exists with varying features. It would be impractical to attempt to catalog them all within the scope of this guidebook. Often, a school or district will adopt one LMS to use system -ide. Educators should check with their school administrators to see what requirements might already exist for LMS use within their classrooms.

Included below are links to resources for some of the more popular LMS:

- Teaching and Learning with Blackboard
- Canvas Instructor Guide
- D2L/Brightspace for K-12 Teachers
- PowerSchool Teacher Resource Center
- Schoology Resources



Synchronous communication

Face-to-face instruction, even virtual, can help to build relationships and provide meaningful interactions between students and teachers. However, teachers should be considerate of students' unique challenges and needs. Not all students feel comfortable being on camera, and not all students have control over their learning environment when not at school. Remember also to be mindful of cognitive workload (or overload!) and avoid the dreaded "Zoom fatigue".

Think about live sessions as opportunities for the following:

- Active collaboration
- Discussions
- Relationship-building
- Small group projects

While these types of activities can also be facilitated in asynchronous ways, synchronous communication lends itself to active, collaborative learning opportunities.

Classroom management is still a factor in virtual settings. Teachers will need to consider behavioral guidelines and establish expectations. When thinking about online interactions, please be considerate and understanding of students' personal lives. If teachers need to assess student participation in video meetings, <u>consider this infographic</u> from Torrey Trust with student-centered guidelines for participation.

The most common synchronous communication tools include Google Meet, Microsoft Teams, and Zoom. These tools offer free and paid versions. During the COVID-19 crisis, some premium features may be available to teachers in hybrid or remote learning environments. We recommend checking with the platform you are interested in using to find their most up-to-date offers for educators.



Google Meet



Google Meet is a video conferencing tool that integrates with other Google products including Gmail and Google Classroom. Enterprise features are available to all users through September 30, 2020.

Device: Cross-platform (Android, Chromebook, iOS, web) **Price:** Free; Additional features available through Enterprise

Features:

- Chat, closed captions, dial-in options
- Record meetings/transcripts to Drive
- Screen sharing options
- Free: single meeting host, up to 100 participants
- Enterprise: multiple meeting hosts, up to 250 participants, live-streaming option

Supplemental resources:

- Welcome to your first day of Google Meet [Google teacher center]
- Google Meet training and help
- Enabling distance learning using Google Meet

Zoom



Zoom is a popular platform for video conferencing that includes traditional features like chat and recording but also includes enhanced participation features such as breakout rooms for small-group discussions and live polls.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free; Pro options available

Features:

- Chat, closed captions, dial-in options
- Record meetings
- Screen sharing options
- Breakout rooms for small-group activities/discussions

- Educating Over Zoom
- <u>Tips and Tricks for teachers on Zoom</u>
- Zoom for Education Resources



Microsoft Teams



Microsoft Teams is a communication and collaboration platform that includes chat, file storage, integration with other Office tools, and video meetings.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free for students and teachers

Features:

- Chat, closed captions, dial-in options

- Integrates with other Microsoft Office tools (e.g., OneNote, Word)

Record meetings

- Screen sharing options

- Creating, attending, and running meetings while using Teams for distance learning
- For teachers: Microsoft Teams Step-By-Step Tutorial
- Microsoft Teams for Education: Quick Start Guide [downloadable PDF]
- Top 5 Ways Teachers Can Use Microsoft Teams During Remote Learning





This guidebook presents a multitude of tools for engaging students during hybrid and remote learning. We do not expect teachers to try them all, rather, we wanted to present options so that teachers could find what works best for them and their students. We grouped tools by activity type, and within each group individual tools present different benefits for implementation. There is no one "best" tool in each category, rather, it depends on the unique setting and situation within each classroom.

For teachers, the focus should be on selecting a set of a few tools that they feel most confident and comfortable in using with students. Teachers should (as we did) choose tools that will provide active, authentic learning experiences for students to apply and connect concepts and reflect on their learning process. Especially during hybrid and remote learning, use technology tools that will provide opportunities for students to collaborate and demonstrate what they know.

Guiding Question

Which technology tools will best help my students achieve desired learning goals and outcomes?

While we organized tools within specific categories, tools might fit into multiple categories. For example, Explain Everything, an interactive lesson tool, can also be used as a screencasting or whiteboard tool. EdPuzzle, Nearpod, and Pear Deck, other tools listed as interactive lessons, can also be used as formative assessment tools. The categories are merely ways to organize tools for easier consumption, and should not be seen as limitations. Teachers should think about what tools will work best for them and their students related to student learning goals and outcomes.





Digital communication tools

Typically, LMS classes have discussion board features with texts and links. Teachers can create topical threads and open them to the entire class, small groups, or as private journaling spaces. While written conversations can be beneficial, digital discussions can rise to the next level through audio or visual elements. Relationships are important - we want to be able to see and hear each other to have engaging conversations. Enter digital communication tools like Flipgrid, Padlet, and Seesaw. These tools provide multimedia-rich spaces for students and teachers to discuss and share with each other.

One of the benefits of digital communication tools is the ability to engage in or hold asynchronous discussions. Students normally reluctant to participate in a live session have time to think about their responses. Also, it allows students to engage with peers at a time that works best for them, rather than having to be concerned with the logistics of live sessions. These tools allow students to engage with each other anytime, anywhere.

Flipgrid



Flipgrid is a video-based discussion platform that helps encourage student participation and support social learning. Educators post discussion prompts using text, video, and supplemental resources, then students respond using their camera.

Device: Cross-platform (Android, iOS, web); Google or Microsoft account needed

Price: Free **Features:**

- Options for public or private groups; moderation
- Adjust recording time limits (15 seconds to 10 minutes)
- Add attachments to topics or video responses

- Getting Started with Flipgrid
- Remote Learning with Flipgrid
- Engage and Amplify with Flipgrid [free, one-hour training course]



<u>Padlet</u>



Padlet is a digital bulletin board great for generating discussion using text and multimedia content. Boards could be used to create collaborative vocabulary lists for a world language class, to facilitate an anonymous class discussion on digital citizenship, or collect learning artifacts from a class field trip.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: 3 boards free; \$12/month for individual teacher accounts; \$1,499/year for school account (includes unlimited teacher/student accounts)

Features:

- Digital bulletin board
- Moderating and privacy options
- Multiple formatting choices (e.g., canvas, grid, stream)
- Participants can add text, images, links, drawings, maps, or upload files

Supplemental resources:

- Example Padlets
- <u>100 Ways to Use Padlet</u> [Anissa Labrador, EdTechTeacher Instructor]

<u>Seesaw</u>



Seesaw is an easy-to-use platform that empowers students to create, collaborate, reflect, and share what they know, think, feel, and understand. Designed for younger students but useful at all levels as a digital portfolio. Seesaw helps "make learning engaging and thinking visible" (Seesaw, 2020).

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free; premium school options available

Features:

- Options for differentiated/personalized learning
- Promotes student voice and choice
- Integrates with Google Classroom

- Get Started on Seesaw [YouTube playlist]
- <u>Get Students Started on Seesaw</u> [Seesaw resources page]
- Seesaw Training and PD [organized by grade level: PK-2, 3-5, 6-8, 9+]



Interactive texts

Each of the tools presented in this section could be used in a traditional format to generate text-based content. However, each of the tools also contains useful features for creating more engaging and interactive content. Google Docs facilitates collaborative writing and integrates other media through embedded audio/video and hyperlinks. BookCreator allows users to create digital books that can be shared with anyone. Google Slides facilitates interactive presentations and can promote active learning experiences.

Google Docs/HyperDocs



Google Docs is a free, web-based word processing program that allows users to create, edit, and share documents. HyperDocs take Google Docs to the next level as "a transformative, interactive Google Doc (...) the ultimate change agent in the blended learning classroom" (HyperDocs, 2020). Google Docs is a great format for students to communicate and develop their ideas and writing skills. Teachers can monitor and provide feedback throughout the writing process, or students can work together on collaborative writing projects.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free; Google account needed to create content

Features:

- Automatically saves work
- Cloud-based (accessible from any device)
- Collaborative features allow collaborators to view, comment, or edit a document and see changes in real-time
- Embed drawings, images, and links to make documents more interactive
- Provide feedback as comments or suggestions
- View version history to see which collaborators worked on a document

- Welcome to your first day of Google Docs [Google teacher center]
- About HyperDocs
- <u>HyperDocs</u> [YouTube playlist]
- Samples of HyperDocs for Every Subject



Book Creator



Book Creator is a simple tool for creating digital books. Students and teachers can combine text, images, audio, video, and embedded content to make original creations such as comic books, custom textbooks, digital portfolios, instruction manuals, research journals, science reports, storybooks, and more.

Device: iOS, web (teacher-only)

Price: 40 books free (online); App is \$4.99/license without VPP; see full feature comparison

Features:

- Add text, audio, video, weblinks
- Accessible to younger students
- Teachers can create a class library to share among students

Supplemental resources:

- Remote Learning with Book Creator
- From Digital Books to Learning Journals with Book Creator

Google Slides



Google Slides is a free, web-based program that allows users to create, edit, and share presentations. Beyond creating presentations, students can use Google Slides as a digital portfolio, interactive notetaking platform, for collaborative group projects, and more.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free; Google account needed to create content

Features:

- Cloud-based (accessible from any device, automatically saves to Drive)
- Collaborative features allow collaborators to view, comment, or edit a presentation and see changes in real-time
- Embed audio, drawings, images, links, and videos
- Provide feedback as comments or suggestions
- View version history to see which collaborators worked on a presentation

- Welcome to your first day of Google Slides [teacher center]
- Slides Tips and Tricks [PDF]



Interactive lessons

Interactive lessons take traditional presentations and add interactive content and activities to create an active and engaging learning experience. Interactive lessons might include multimedia content, 3D models, embedded audio or video, links to additional resources, or virtual tours. They might also incorporate elements of formative assessment through drawing, open-ended questions, polling, quiz questions, and other written responses.



Explain Everything



Explain Everything is a powerful tool for creating engaging multimedia presentations that integrate content from a variety of sources, or for use as a digital whiteboard tool. Students and teachers can use Explain Everything to create lessons, present projects, and demonstrate problem-solving strategies through whiteboard mode.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free; \$3/month for individual educator account; Educator group plans available

Features:

- Free: 3 projects, 1 slide, 1-minute recording, 200MB storage
- Educator account: unlimited projects, slides, recordings, 500MB storage/user (1-9 users)
- Import a variety of file types or use as a whiteboard

- Back to School with Explain Everything [focused on remote learning]
- Whiteboard for Remote Learning



Nearpod



Nearpod transforms traditional presentations into engaging, interactive experiences. Educators can easily add interactive activities and content to an existing presentation or use lessons from the Nearpod library. Host a live, teacher-led session or allow students to complete on their own time.

Device: Cross-platform (Android, Chromebook, iOS, web); lessons best created on a laptop **Price:** Free; Premium options for individuals/schools/districts

Features:

- Live, teacher-led session or asynchronous, student-paced
- Add interactive content and activities (e.g., drawing, quiz questions)
- Import existing presentations (e.g., Google Slides, PowerPoint)
- Instant feedback with detailed reporting

Supplemental resources:

- Nearpod Teacher Resources [blog, instructional lessons, live/on-demand webinars]
- How Nearpod Makes Distance Learning Easy [blog post]

<u>Peardeck</u>



Teachers can use Pear Deck to create interactive lessons within Google Slides that facilitate active learning, deeper learning, formative assessment, feedback-driven metacognition, retrieval practice, and social-emotional learning (Pear Deck, 2020).

Device: add-on for Google Slides and Microsoft PowerPoint

Price: Free; \$149.99/year for individual license; custom school/district pricing available

Features:

- Customizable formative assessment templates
- Insert multiple question types
- Instant feedback with detailed reporting
- Teacher-led live session option

- <u>Learn Pear Deck</u> [professional development resources]
- Remote Learning Resources [educators, administrators, parents]



<u>Edpuzzle</u>



With Edpuzzle, teachers can turn any video into an interactive lesson. Educators can use existing videos or upload their video creations to make a flipped classroom a reality.

World language teachers could insert vocabulary checks within a video, social studies teachers could insert critical thinking questions based on video content, STEM teachers could insert questions that check for understanding, and so on. Students can also create Edpuzzle videos to demonstrate deeper understanding of a topic, adding their questions and responses for peers to complete.

Device: Cross-platform (Android, Chromebook iOS, web)

Price: 20 videos (Free); \$11.50/month Pro Teacher account; custom pricing available

Features:

- Access to 5 million+ videos
- Add questions, audio, and notes
- Integrates with many LMS
- See detailed analytics on student participation and results
- Live mode option (not currently compatible with Android)

- Edpuzzle Help Center For Teachers
- EdPuzzle: A Core Tool During the Coronavirus Closures





Audio production

With students learning outside of the classroom, it is important to share content with students in easily accessible formats. One example of this is through audio recordings, which can benefit both teachers sharing content and students demonstrating their knowledge. With consuming content, audio gives students the power to rewind, fast forward, pause, replay, and otherwise engage with content at their own pace. With generating content, audio provides students an opportunity to demonstrate their knowledge without worrying about writing skills or being on camera while presenting.

Audio can range from simple tools for recording audio to more advanced tools with editing and publishing options.

Synth

0

Synth is a podcasting tool that promotes bite-sized, interactive podcasts. Teachers can create a class podcast and invite students to participate. Students might engage with and explore content on a certain topic, then come together in Synth to provide a quick reflection of their learning.

Device: iOS, web

Price: Free **Features:**

256 second limit

Add to podcast or share via multiple sharing options

- Options for student accounts / participation without email

Supplemental resources:

- For Education - Synth

- Five Ways for Teachers to Use Synth

- Seven Ways to Use Synth with K-12 Students



Audacity



Audacity is free, open-source software for creating and editing multi-track audio recordings. As there is a learning curve to using the software, this tool might be best used with middle or high school students. In world language classes, students can record themselves conversing with each other or speaking out loud. In social studies, students might create a class podcast that contains multiple viewpoints illustrating different perspectives during a historical event.

Device: Mac, PC

Price: Free Features:

- Download MP3 file

- Trimming options

Supplemental resources:

- <u>Audacity Review for Teachers</u> [Common Sense Education]

- Audacity Manual

Online Voice Recorder (123Apps)



Online Voice Recorder is a simple, online tool for voice recording. 123Apps also includes additional tools for editing and recording audio and video. Use within any web browser to create simple audio recordings to share with students.

Device: web

Price: Free (with ads)

Features:

Download MP3 file

- Trimming options

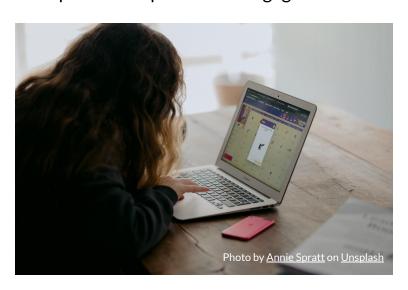




Screencasting

A screencast is a recording of the activity occurring on the screen of a laptop or mobile device. Screencasting is a powerful tool for both students and teachers in creating content and demonstrating knowledge. Screencasts can also be shared with others to generate feedback and establish an authentic audience.

Teachers can use screencasting to create engaging, easy-to-understand video lessons to increase student comprehension. Screencasts are not necessarily professional-level videos, they do not need to be perfect to share with students. Keep screencasts short by chunking content into manageable amounts of time. Elementary and middle school students do not have the attention span to focus on videos of 10 minutes or more. Intersperse videos with activities to reinforce concepts and keep students engaged.



Students can use screencasting to demonstrate their understanding of concepts in real-time. They can explain their thought process as they draw a diagram, solve a mathematical equation, or write a story. They can also use screencasts to reflect on the artwork they created, or practice presentations, or showcase their musical and physical talents. When students create screencasts, they make their thinking visible, allowing the teacher to measure several aspects of the learning experience including how students engage with content, the student learning process, student progress over time, and students' knowledge and understanding of a topic.



<u>Screencastify</u>



Screencastify is a free tool that allows users to easily record, annotate, edit, and share screencasting videos. Recordings automatically save to Google Drive.

Teachers can use Screencastify to demonstrate a concept or provide instructions, then easily share with students via Google Classroom or Drive. Students can use it to discuss their thinking on a writing draft, demonstrate their understanding of a math problem, or reflect on a learning artifact.

Device: Chrome browser

Price: Free; \$49/year for the paid version

Features:

- 5-minute video length limit (unlimited for paid)

- Annotation tools

- Files save directly to Google Drive

Export files as MP4, audio-only, or animated GIF

Supplemental resources:

- Screencastify Classroom Resources

- <u>Screencasting with Screencastify</u> [5-min YouTube tutorial by Tom Driscoll]

Loom



Loom is a video recording tool that allows users to easily record and share screencasting videos. Loom Pro includes advanced recording and editing features including annotations, hyperlinks, and more.

Device: Chrome browser, Mac, PC

Price: Pro is free for verified student/teacher accounts

Features:

Unlimited recordings

Annotation tools (Pro account)

Password-protected videos

Supplemental resources:

Loom for Education

- Guide to Using Loom for Education



iOS Screen Recorder

iOS Screen Recorder is a built-in tool on any iOS device running iOS 11 or later including iPads, iPhones, and iPods.

Device: iOS device

Price: Free (Built-in feature with iOS 11+)

Features:

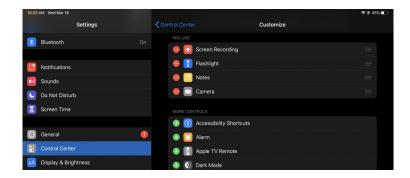
- Narration possible with microphone activated

- Saves to Camera Roll or Photos

Can be exported to Google Drive/cloud-based locations

Supplemental resources:

- iOS Screen Recording as a Screencasting Tool



Quicktime



QuickTime is a free tool built-in to Mac laptops. Record the entire screen or just a selected portion and use circles to show mouse clicks while recording.

Device: Mac **Price:** Free **Features:**

- Record the entire screen, a selection, or webcam only
- Show mouse clicks to direct viewers' attention

Supplemental resources:

- How to use QuickTime Player



Video creation

Video tools can help keep students engaged with teacher-led instructional content and provide a creative outlet for students. Record and edit instructional videos in screencasting or video creation programs, then embed in other tools (e.g., Google Slides) or post to a class LMS.

We know that the student-teacher relationship is a critical component of teaching and learning; we also know this is more difficult in hybrid or remote learning environments. Rather than posting a generic instructional video, when a teacher records themselves delivering instruction, there is a personal connection and social component. Even so, teachers should always focus on determining the instructional purpose first. Also, think about the length and keep videos short or break longer content into shorter segments. Similar to screencasting, teachers should not expect perfection. Most video editing programs provide simple editing tools if small errors are bothersome, but also remember that they can add a humanizing aspect to digital content. Remember to bring energy and have fun, as this will help students stay engaged and interested while watching videos.



For students, videos can be a great option to creatively demonstrate their knowledge. However, rather than requiring students to make videos, teachers might consider video creation as one choice in a menu of options. Hybrid and remote learning is not the time to introduce new tools, and not all students may be comfortable with or proficient at video creation.



<u>iMovie</u>



iMovie is an application that allows users to create and edit simple videos and share them with others. Students can create book trailers, record music or visual performances, create stop motion videos, and more. Teachers could also use iMovie to create more polished screencasting videos for direct instruction.

Device: iOS, Mac

Price: Free **Features:**

- Green screen capabilities
- Integrates between devices (iOS/Mac only)
- Sharing options
- Video editing features (e.g., animated titles, special effects, video filters)

Supplemental resources:

iMovie Support

WeVideo



WeVideo is a powerful video creation, editing, and publishing tool that allows students and teachers to collaborate on multimedia video projects. Students might work in small groups to make collaborative documentaries on historical topics, music videos to demonstrate vocabulary in world language classes, or newscasts to share about current events.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free 30-day trial for teachers; \$299/year for an individual classroom (up to 30 students); group/school/district pricing options available

Features:

- Cloud-based
- Collaborative projects
- Green screen capabilities
- Stock video, image, and audio files

- Remote and Blended Learning for WeVideo
- The Educator's Guide to WeVideo



Subject-specific tools

It would be impossible to cover the plethora of subject-specific tools that exist. As such, we have included a highlight of some of our favorite tools for a range of subject areas that we think teachers will find most beneficial for use in a hybrid or remote learning environment.

Desmos



Desmos is an online graphing and scientific calculator but also includes interactive math simulations.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free; Create an account to access classroom activities

Features:

- Graphing and scientific calculators
- Plot graphs and create tables
- Use sliders to animate or visualize graphs
- Interactive math simulations and classroom activities

Supplemental resources:

- Desmos for Teachers

<u>EquatIO</u>



EquatIO gives students and teachers the ability to easily create formulas, graphs, and mathematical equations in a digital format.

Device: Cross-platform (Chromebook, iOS, web); Chrome extension; LMS plug-in

Price: Free for teachers

Features:

- Create math expressions via handwriting recognition, keyboard, and voice dictation
- Compatible with LaTeX
- Create interactive digital math quizzes
- Integrates with Google tools

Supplemental resources:

Top 5 Ways to Use EquatIO in the Classroom



Google Earth



Google Earth is "the world's most detailed globe". Google Earth helps students explore the world, develop critical thinking skills, become creative communicators, and visualize data. Teachers can use existing content and lesson plans from Google Earth Voyager or create custom lessons. Students can work on collaborative projects using Google Earth creation tools.

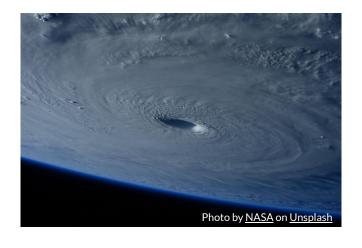
Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free; Google account needed to create content

Features:

- Global navigation
- Creation tools
- Collaborative projects
- Measurement tools
- Curated projects and guided tours
- Supplemental resources for educators

- <u>Google Arts and Culture</u> [Explore art, culture, landmarks, and museums]
- Google Earth Education [links Google Earth Voyager with classroom activities]
- Google Earth Engine [visualizing 30+ years of public geospatial/historical data]
- Google Earth Voyager [curated projects and guided tours]
- Enhancing Curriculum through Google Earth
- Google Earth: Intro to Creation Tools [YouTube]





Creating Engaging Digital Lessons

<u>Newsela</u>



Newsela is a website that provides students with access to thousands of real-world texts at five different reading levels. Teachers can differentiate instruction, engage students with diverse perspectives, and monitor student progress through built-in reporting. Subject areas include current events, English-Language Arts, science, social studies, and social-emotional learning.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free; Paid accounts include additional content and instructional resources

Features:

- Differentiate instruction with leveled texts
- Customizable lessons (including multiple-choice quizzes and writing prompts)
- Annotation tools
- Search filters (e.g., grade level, standards, subject-specific)

Supplemental resources:

- Distance Learning with Newsela
- Newsela Resources [blogs, case studies, webinars, white papers]
- PRO Teacher Resources

Read&Write



Read&Write is a software toolbar that makes digital content more accessible. Educators can use it to help struggling students engage with and understand content. Students can use it with any subject area for understanding content, conducting research, and writing.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free for teachers

Features:

- Dictation and text-to-speech
- Proofreading support (e.g., grammar, spelling)
- Research support tools
- Vocabulary lists

Supplemental resources:

- <u>Using Read&Write for Remote Learning</u> [4-min YouTube video]



Reimagining Assessment

The transition from traditional classroom instruction to hybrid and remote learning upends traditional assessment methods. No longer are students packed into a large auditorium to take multiple-choice, paper-and-pencil tests. At home, with an Internet connection, students are connected to a wealth of information and resources. Teachers should take this opportunity to reimagine assessment and think about ways that technology can transform assessment methods and purposes.

A selection of different assessment types include:

- Active: Student-centered

- Authentic: Applicable in real-world situations

- **Experiential:** Learn or reflect by doing

Formative: Measuring student product, process, and progress

(O'Keefe, Rafferty, Gunder, & Vignare, 2020)



In particular, formative assessment provides a more comprehensive understanding of student learning and can also serve as a quality assurance measure for measuring instructional impact. Formative assessment can guide instructional practices and help teachers better understand how to guide students throughout the learning process.

In thinking about product, process, and progress, teachers might ask:

Product: What did students learn? Did they meet the learning objectives?

Process: How did students engage with content and each other during learning?

Progress: How did students improve?

What learning gains did students achieve?

(Guskey, 2020)



Reimagining Assessment

Formative assessment helps to make student thinking visible. Not only do students demonstrate what they know, but also what they think, feel, and understand about a topic. Making thinking visible can occur through the written word, images, audio, video, screencasting, or a combination of mediums. Many of the technology tools we presented in the designing digital experiences section also serve as ways to assess student learning.

Teachers will need to determine plans for providing feedback including when, how, how much, and in what format? Often, the tools presented in this guidebook provide teachers with avenues for generating and sharing feedback with students.

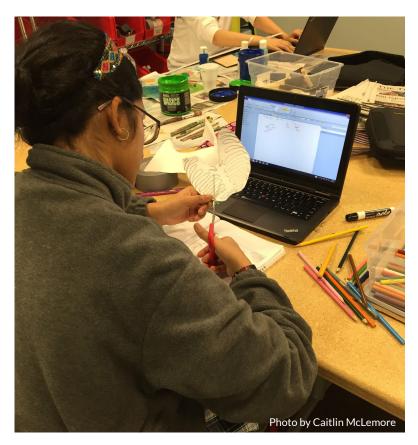


When considering assessment methods in hybrid and remote learning, teachers should promote student choice and voice as much as possible. As students are having to do more of the learning process outside of the classroom, they will need to be more autonomous and independent learners. As such, providing multiple pathways for achievement and demonstrating knowledge will help facilitate positive and successful learning outcomes. With remote learning, incorporating student voice is critical to ensure authenticity with learning artifacts (e.g., did the student complete the assignment or someone else?).



Formative assessment can occur throughout the learning experience, not just at the end. In this section, we will introduce several tools for creating polls and surveys to collect student data, specifically for formative assessment purposes. Teachers can use polls and surveys to establish a baseline of knowledge before embarking on an instructional unit, or as checks for understanding through the unit.

Digital portfolios are another example of formative assessments that allow students to demonstrate how they think, feel, and understand content as they progress through content. Some LMS include a portfolio feature within the tool, so teachers should check with their school or district to see if an LMS-based digital portfolio is an option or requirement. Otherwise, teachers can use free or paid tools to implement digital portfolios in the classroom. For example, in <u>Google Slides</u> students can embed or link to their analog and/or digital work, while also including text, audio, or video reflections. <u>Seesaw</u> is another tool with great potential for use as a digital portfolio. In Seesaw, students can document their learning by including a variety of multimedia, both as a product to demonstrate the learning process and self-reflection.





Polls

Polling tools allow teachers to quickly survey students whether they are assessing student knowledge before a lesson, doing a quick check for understanding during a lesson, or simply asking students' opinions. Polls can take a variety of question formats including open-ended responses, word clouds, and more. Most polling tools allow for anonymous responses, encouraging reluctant students to participate, and allowing teachers to display responses.

<u>Mentimeter</u>



With Mentimeter, teachers can generate real-time input from students in a live or remote setting through live polls, Q&A, word clouds, and more. Teachers can use Mentimeter to gauge student comfort level or existing knowledge before introducing a topic or during a lesson as a quick check for understanding.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free; Educational pricing options available for individuals/groups

Features:

- Unlimited audience size and number of presentations
- Multiple question types

Supplemental resources:

- Mentimeter: Tools for Online Teaching

Poll Everywhere



PollEverywhere is a tool that teachers can use to create live polls, Q&A, and more. Students participate on their own devices and teachers can instantly see and display results.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free; Educational pricing options available for individuals/groups

Features:

- Multiple question types (e.g., multiple-choice, poll, word cloud)

- Resources for remote work and teaching
- Remote learning toolkit [downloadable guide]



Surveys & quizzes

The following tools help teachers create surveys and quizzes to collect student information or assess students on a particular topic. Teachers can create surveys to ask students what they know, think, feel, and understand about content, to evaluate their own teaching methods, or to gather student preferences for group work and other assignment options. Some quiz tools provide auto-grading options.

Google Forms



In Google Forms, teachers can create quizzes and surveys to gather data and conduct formative assessments. Embed images and videos to supplement questions. Integrates with Google Sheets for in-depth data analysis options.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free; Google account needed to create content

Features:

- Cloud-based (accessible from any device)
- Embed images, links, and videos
- Insert a variety of questions (e.g., short answer, multiple-choice, linear scale)
- Quiz options (e.g., auto-grade, provide automatic feedback)
- Automatically visualizes individual responses and a summary
- Responses linked to a spreadsheet in Google Sheets for further data analysis

- Welcome to your first day of Google Forms
- What can you do with Forms?
- Locked Mode in Google Forms [YouTube]





GoFormative



Formative is a web-based tool that allows teachers to create live assessments or assignments for their students. Easily accessible from any device, teachers can adapt existing lessons or create new content and integrate opportunities for formative assessment within assignments.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free basic account; premium and school/district pricing options available

Features:

Unlimited activities

- See student responses in real-time

- Options for feedback

Integrates with Google Classroom

Supplemental resources:

- GoFormative library

- A Guide to Creating a Virtual Classroom with Formative

- How to Create a Virtual Classroom with Formative! [YouTube]

Socrative



Socrative is a tool that helps teachers to assess students through real-time activities including quizzes and reflection questions. Teachers can gather student responses as a formative assessment or simply to gather feedback on a lesson.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free basic account; K-12 Pro \$59.99/year; bulk pricing available

Features:

- Launch up to 20 activities at once

- 50 students per room, 20 rooms per teacher

- Restricted access or share via link

- Space race countdown timer

Supplemental resources:

- Getting Started with Socrative

- Socrative Webinars



Gamified assessment tools

With tools like <u>Kahoot!</u>, <u>Quizizz</u>, and <u>Quizlet</u>, gamified elements of competition and points generates excitement and increases student engagement. ELA teachers can assess students' understanding of class novels in a fun way, or world language teachers can create gamified quizzes for vocabulary checks. Any teacher can use a gamified quiz platform to create checks for understanding or review content.



Quizizz



Quizizz is a gamified quiz platform that teachers can use to create their own games and quizzes or utilize existing resources. Students can see the questions and answers on their own devices and practice on their own. Quizizz is free for K-12 teachers.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free for K-12 teachers

Features:

- Create games and interactive lessons
- Import teacher-created content or use existing content from the Quizizz library
- Live or student-paced session options
- Unlimited number of quizzes and sessions

- Hosting a live game in a remote setting
- Quizizz for School Help Center
- The Quizizz Guide to Distance Learning



Kahoot



Kahoot! is a game-based learning platform that teachers can use to create games and quizzes. Accessible on any device, students can compete and earn points by answering questions. The teacher screen shows the questions and answer choices, while the student screen only shows response choices.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free; Premium accounts available

Features:

- Create games and interactive lessons

- Import teacher-created content or use content from the Kahoot! question bank
- Add images, slides, puzzles, etc. between questions (premium)
- Live or student-paced session options
- Basic student reporting (additional reporting available with premium)

Supplemental resources:

- Kahoot! For schools: how it works
- Kahoot! For schools: distance learning
- Starter guide to distance learning with Kahoot! [PDF]

Quizlet



Quizlet is a digital flashcard tool. While not specifically designed as an assessment tool, Quizlet helps students prepare for assessments through various study modes and teachers can create study sets for students to review.

Device: Cross-platform (Android, Chromebook, iOS, web)

Price: Free; \$35.99/year for premium teacher account; bulk discounts available

Features:

- Students choose from seven different study modes
- 500 million + existing study sets
- Customization and student reporting options (premium)

- Quizlet Remote Learning Quick Start Guide
- Quizlet Teacher Guide



Additional Resources



From EdTechTeacher. Includes articles, resources, and tool guides to help educators implement meaningful hybrid and remote learning experiences.

Learning Keeps Going

From EdSurge/ISTE. Includes an Educator Help Desk, list of free tools, and more resources for educators and families.

Teach from Anywhere [Google]

From Google. Downloadable PDF designed to help educators, families, and schools support students during hybrid and remote learning.

The Ultimate Guides to Online Learning

From Michigan Virtual Learning Research Institute. Free guides for students, parents, mentors, teachers, and administrators.

COVID-19 Online Learning Resources

From Global Online Academy. Includes article collections on designing online learning experiences, leadership, professional learning, and more.



References

CAST (2018). Universal Design for Learning Guidelines version 2.2. Retrieved from http://udlguidelines.cast.org

Fosslein, L. & Duffy, M. W. (2020, April 29). How to combat Zoom fatigue. *Harvard Business Review*. https://hbr.org/2020/04/how-to-combat-zoom-fatigue

Guskey, T. R. http://tguskey.com/

Harvard Graduate School of Education (2020, July 8). *Education now: What makes a high-quality remote or hybrid learning experience?* [Video]. YouTube. https://youtu.be/EFA9S09ysMc

Jonassen, D., Howland, J., Marra, R. M., & Crismond, D. (2008). How does technology facilitate learning. *Meaningful learning with technology*, 5-10.

Lindsey, L. A. (2020, August 16). Should students have cameras on or off? Answer: Yes.

https://www.edvolvelearning.com/blog/should-students-have-cameras-on-or-off-answer-yes

McTighe, J. & Wiggins, G. (2012). *Understanding by Design Framework* [White paper]. Association for Supervision and Curriculum Development. http://www.ascd.org/ASCD/pdf/siteASCD/publications/UbD-WhitePaper0312.p

Metha, J. & Peeples, S. (2020, June 25). Marie Kondo the Curriculum. *Albert Shanker Institute*. https://www.shankerinstitute.org/blog/marie-kondo-curriculum



References

O'Keefe, L., Rafferty, J., Gunder, A., Vignare, K. (2020, May 18). Delivering high-quality instruction online in response to COVID-19: Faculty playbook. *Every Learner Everywhere*. http://www.everylearnereverywhere.org/resources

Petrilli, M. J. (2020, May 27. Half-time high school may be just what students need. *Thomas B. Fordham Institute*.

https://fordhaminstitute.org/national/commentary/half-time-high-school-may-be-iust-what-students-need

Reich, J. & Mehta J. (2020a) *Imagining September: Online design charrettes for fall 2020 planning with students and stakeholders*. https://edarxiv.org/ufr4q

Reich, J. & Mehta J. (2020b) *Imagining September: Principles and design elements for ambitious schools during Covid-19*. https://edarxiv.org/gga2w

Stanford, D. (2020, March 16). Videoconferencing alternatives: How low-bandwidth teaching will save us all. *IDD Blog*.

https://www.iddblog.org/videoconferencing-alternatives-how-low-bandwidth-teaching-will-save-us-all/

Trust, T. (2020). Using video to assess student attention during virtual meetings. https://torreytrust.com/projects/

Young, J. R. (2020, April 8). When to teach online classes live and when to let students learn on demand. *EdSurge*.

https://www.edsurge.com/news/2020-04-08-when-to-teach-online-classes-live-and-when-to-let-students-learn-on-demand?utm campaign=site&utm content=share-622

