

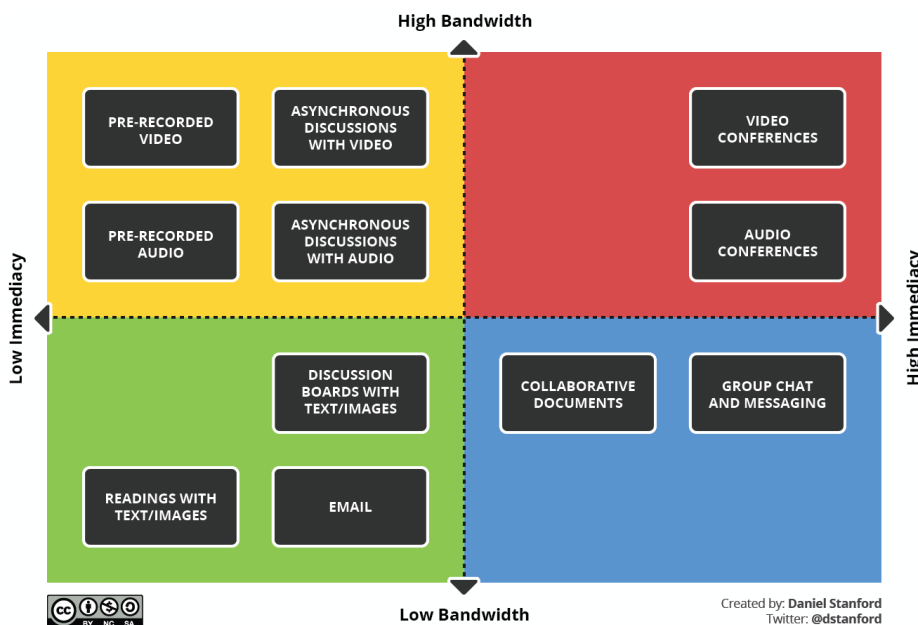
Not all students have good bandwidth and/or reliable connectivity to the Internet. Remote regions, Indigenous communities, international countries, low income families, students living on their own - are some of the populations that are caught in the 'digital divide'. The pandemic is making this 'divide' more visible. Anything we can do, as educators, to support learners with low bandwidth or limited connectivity will go a long way for their learning. This document provides some tips for creating a more accessible course for students with low bandwidth or limited connectivity.

### Bandwidth v. Immediacy

We take for granted good bandwidth and reliable access, but that is not the case with all our learners. This diagram (below) from [Daniel Stanford](#) outlines the options available to instructors to provide alternatives for live online class gatherings and classes. It is a good overview of what we desire in terms of 'immediacy' of the content and engagement vs. the bandwidth that delivery formats take.

He states: "High-bandwidth technologies work great for students who have newer computers, fast and reliable internet access at home, and unlimited data plans on their phones. For other students, courses that require frequent use of high-bandwidth technologies can limit their ability to fully participate in course activities. This can jeopardize their success in the course, create a sense of shame and anxiety, and leave them feeling like second-class citizens.

The second factor, immediacy, refers to how quickly we expect our students to respond when interacting with us and with each other. Typically, we think of immediacy as a good thing. It's baked into face-to-face learning, so it doesn't feel like a limited resource. But one of the biggest advantages of online learning is that it can provide you and your students with more flexibility. When we require our students to be online at exactly the same time, we sacrifice one of the key benefits of online learning, and that can make an online course feel like more of a burden than it has to be."



**Green Zone:** Readings with text and images give students foundational learning pieces they can download, print and read offline. Email and discussion boards are also low bandwidth ways to engage learners especially through use of Blackboard Learn. These formats have been in use for decades and still work today for creating rich learning experiences for students. Consider them as a foundation for your course.

**Blue Zone:** Collaborative documents like [Microsoft Office](#), [Blackboard Learn wiki](#) or through OneDrive or Google Docs give students opportunities to work on the same document. Group chats and messaging are done through many products like [Group Me](#) and [Slack](#) and don't require students to be on video conferencing all day.

**Yellow Zone:** This zone is all about creating video and audio components for your course that students can access when they have connectivity and time. Typically, these are screencasts (videos of your screen) with audio narration or could be video of you talking or demonstrating something. Use Kaltura Capture to create short videos for students to watch through streamed Kaltura video storage. Do not upload your video to Blackboard Learn - instead just share the URL after you publish it to Kaltura via My Media in Blackboard. Kaltura has a nice suite of editing tools for snipping out a part (where you coughed) or adding in a quiz to ensure students watched the video. Students are more likely to watch a short 2-3 minute video than anything longer in length.

**Red Zone:** This is live, online video conferencing classes done through BlueJeans. Zoom, Skype, Facetime and WebEx are other products that do the same thing. All these products require significant bandwidth and reliable connectivity to the Internet (unless you have students use the toll-free numbers to call in). BlueJeans is good for office hours, review sessions, consultations with students. Students feel somewhat connected to their peers but also to you, the instructor. You can use the tone of your voice, facial expressions, and body language to convey meaning. Unfortunately, BlueJeans is the most inflexible and bandwidth-intensive activity we can ask of our students. Before you rely on it heavily, look at the other zones and see if there is any other way you can accomplish your learning outcomes.

### Designing your Course: Choosing Accessible Tools and Platforms

- Use mobile responsive design platforms and tech tools that allow for cell phone access (e.g., applications that can resize content for smaller resolution rather than needing to scroll or zoom in to see content)
- Include components in your course outline that address access to learning and content and how you have organized the learning so there are options
- Poll your students to find out about their devices, connectivity, and technologies they have access to or not.
- Try to find solutions that work for the whole class to prevent having to do accommodations for individual challenges
- Be flexible to student impacts on their learning such as health, location, financial situation, travel, family situation etc.

### Tips for Accessible Blackboard Learn Courses

- Focus on asynchronous instruction over synchronous (more of course available through activities and learning experiences done at their own speed/time)
- Include more audio recordings (vs. video recordings) if you can just podcast with no visuals
- Put all items to be downloaded in one spot for ease in limited access (vs. have to locate content all through the course) - ease for limited connection time (consider a zipped file for ease in quick downloading)
- Create a very simple format for finding content and materials in your Blackboard Learn course (e.g., use the same file folder structure each week or topic making navigation easier for students week-to-week)

- Provide resources in as many text formats for reading and small file size (if have a PowerPoint slide show, also have the notes collated in one spot for reading separately) or if you have a video ensure the script or transcript is included for students
- Record the delivery of content or a lecture (called flipped learning) always done in small chunks - rather than hosting a BlueJeans/synchronous class and upload content to Kaltura (and grab URL) or to Blackboard Learn

### Tips for Improving Access to Live Online (BlueJeans) Class Meetings

- If you are using Bluejeans or live synchronous learning experiences - consider conducting a poll of your students to determine what timezone they are in and what bandwidth and connectivity they have. This will help you understand your learners.
- If you do have a synchronous class meeting, make students aware of Canada phone toll-free number 1.778.807.4955 to call into BlueJeans calls (or if calling in from outside of Canada use the other toll-free number 1.866.599.3622)
- If students join by BlueJeans App and are not on free or home wi-fi inform them that there will be data charges - encourage them to join only by computer /app audio (turn off video)
  - Wireless connections are always less than the top speeds or transferring data on a wired connection. If you cannot connect using a wired connection, move closer to your Wi-Fi access point for the least interference between the connection and your device.
- Optimize BlueJeans calls:
  - Everyone in the meeting or virtual class should close all web-based applications (e.g., Outlook, websites, YouTube videos etc.), to ensure less competition for bandwidth and background requirements for the Internet (e.g., synching in cloud-based drives, updating apps for software, tools checking for new email).
  - Turn off or temporarily suspend all streaming video services (e.g., Netflix, CraveTV, live gaming sites) so that the bandwidth coming into the location can be mostly allocated to the video-conference meeting
- If you have tried everything to improve the quality of your connection and the video continues to be blurry or cut out, consider switching to audio only (turn off your video). If you are having difficulty hearing other participants, ask them to consider switching to audio only (turn off their video).
- While on the App you can switch to phone audio only: Instruct students to click on the downward arrow ("Audio Options") that can be found in the lower-right of the microphone symbol. This will display the option: "Switch to Phone Audio." Selecting this option will bring up instructions for connecting to audio by phone. In this instance, you would still get video and other content using the BlueJeans App, but the audio would come from the phone instead.

### Tips for Making Assignments More Accessible

- Create mobile-friendly, low bandwidth assignments for students with choice so they can decide what works best
- Design downloadable workbooks and assignments that students can take with them to complete offline
- Provide accommodations for some students to hand in assignments via email rather than Blackboard Learn
- Include instructions for assignments in Word documents or PDF formats for students to read on their own

### Tips for Formatting Your Content for Access

Simple formatting of content can often have huge impacts on the file size for students to download and access. In most productivity software (slide creation, word processing, photo editing) you can choose compressed or smaller file sizes as the output of your saved file.

#### Slides

- Consider adding notes to your slide deck (under each slide) in addition to or instead of voice over narration to provide a more accessible format for students to access with low bandwidth or connectivity
- Optimize photos and images in slides (go to compress all images) so that your slide deck is the smallest in file size it can be
- Do not put gratuitous graphics in your documents that serve no purpose other than decoration (only use images that have meaning and need to be there) - removing them will reduce the size of your slide deck

#### Word Documents

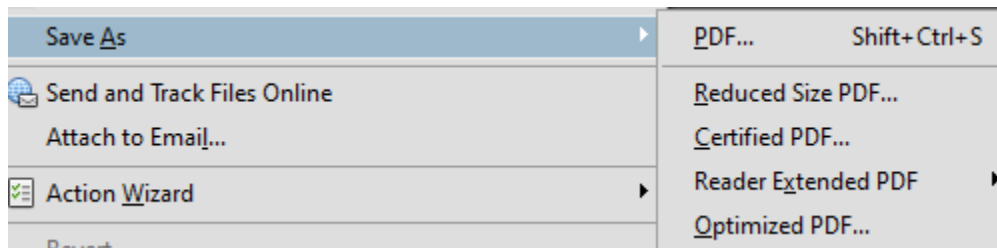
- Don't put gratuitous graphics in your documents that serve no purpose other than decoration (only use images that have meaning and need to be there)
- Break long documents up into smaller documents (shorter/smaller are better for students to access and download, as well as find content and navigate through it)
- Optimize documents – use .docx, compress images, remove extra information – website <https://www.howtogeek.com/361463/how-to-reduce-the-size-of-a-word-document-apart-from-compressing-images/>

### Video

- Tell students to choose a lower quality setting to view videos (e.g., 360 pixels vs. 1080 pixels) when viewing YouTube and Kaltura videos
- Tell students they can watch a video at normal speed or faster speed (2x etc.)
- Create chapters in your videos (in Kaltura editing after created a video) so students can search and find parts of your video faster
- Optimize video files – by uploading to Kaltura and providing URL to students rather than uploading the file to Blackboard – the URL off Kaltura will flavour it for the type of device students have (provide the correct size and version for their Mac or PC, mobile device or larger screen, connectivity speed etc.
- Upload a transcription with your video if not created already - students with hearing impairments and English as Additional Language learners will appreciate the transcript to read too

### PDFs

- Optimize PDFs in Adobe Acrobat Pro version – save as a ‘reduced size PDF’ or in Word when saving to PDF choose “minimum size” rather than ‘standard size’ or in Mac “best for electronic distribution” vs. “best for printing”



### Images

- Optimize Images – image files are quite large – try to reduce in using a photo editor or use free versions of TinyPNG <https://tinypng.com/> (vector/line art) or <https://tinyjpg.com/> for photos
- Aim for under 100K for images
- This applies to Word documents, slide shows, web etc.