

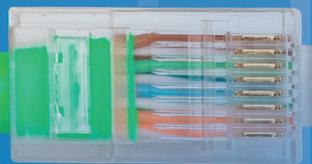
Bandwidth



Bridge to the Last



Frontier





Internet access increases educational opportunities. Here's how to get your students online—no matter where you are

By Damon Hargraves

Alaska is known as “The Last Frontier.” In an area three times the size of Texas and one-fifth the size of the contiguous states, Alaska has a population of 740,000.

Almost half of Alaska’s population resides in Anchorage, while the largest five school districts make up 68 percent of the state’s 129,969 students. Of the 54 school districts in Alaska, the majority of them are off the highway system, and all school districts have a rural component. Even in schools with hundreds of students, or in communities with multiple schools, these schools remain physically isolated.

My own island community of Kodiak has a high school, a middle school, four elementary schools, and a K–12 school 45 minutes outside of town, in addition to a half-dozen rural schools that are maintained off the island road system. These village schools are accessible only by boat or small plane, and the entire school district is in the Kodiak Island Archipelago, which is more than a hundred miles from the closest mainland highway.

It’s 2018, but Alaska remains very much a frontier. School districts cover huge areas with relatively small numbers of students. The creative frontier spirit lives on in our collective desire and ability to quickly assimilate new technologies that help us communicate, connect, and provide opportunities for our kids.

Technical Challenges Call for Creativity

Videoconferencing is a mainstay in all our schools, and it provides an avenue to broaden

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options for our students to participate in needed interventions or extensions of learning that aren’t available locally.

One of our successful offerings is reading intervention, offered by a certified teacher located here in town. Our interventionist communicates via email and chat with teachers at our rural sites and schedules one-on-one intervention time with students in grades 1 through 4. Some of the teachers at our rural sites are working with students in six or more grade levels; teachers might have a first-grader and a sixth-grader in the same class. Such arrangements stretch teachers’ logistical capacity to differentiate, and outside help in targeted interventions is very important.

Our “virtual teacher” utilizes videoconferencing to connect with the students individually and do intervention exercises similar to what you might see in any of our town schools. Through videoconferencing, she can work with students across the archipelago, and she is offering attention, engagement, and access to interventions that would never be available otherwise.

USING TECHNOLOGY TO CLOSE THE GAP

Don’t let geography or logistics limit your students and staff. Answer these reflection questions to begin exploring technological solutions:

- What tech tools do you have available right now in your school?
- What tools does the district offer that you are not currently utilizing?
- What physical barriers or time challenges keep you and your staff from communicating at the level that you need?
- What technology can you use to circumvent these barriers and bring your staff together in new ways?
- What equipment do you still need to open up new ways of learning?

This amazing project, and others, are done under tough technical conditions. Many of our successes rely on high-speed bandwidth and a reliable connection in the midst of the world's most difficult terrain and weather. High-speed fiber networks continue to be built, but most schools across Alaska still connect via satellite or microwave networks. These technologies are susceptible to sun-spots, high winds, snowfall, and thick fog. Kodiak faces all of these.

Even in the best of conditions, satellite connections have high ping times, which result in delayed video and audio. You can probably relate to high ping times if you've ever experienced a bad long-distance phone call where the other person has a delayed response when you are talking with them. Small delays also cause frustrating experiences. We regularly experience ping times of 800–1600ms or more, which affect the ability of videoconferencing participants to interact. The video and audio might be great, but the high ping times and resulting delay limit the ability of participants to have the back-and-forth conversation so important in teaching and learning.

These ping times also limit the abilities of the IT Department to support staff. On-screen support, where a computer technician offers support by taking over your computer screen, is very common in places outside of Alaska, but this technique is rendered unreliable for us much of the time. So, we find other ways to help. IT staff often will use a Microsoft Teams or BlueJeans screen-sharing session to talk a teacher through troubleshooting steps. Technology limitations also affect instruction in similar ways.

New Technology Offers Solutions

To squeeze every drop of instructional capacity out of our bandwidth, we use caching servers and packet-shaping services. You can think of caching as similar to your DVD collection at home. Even though you only have one cable TV box, you can still utilize DVDs to play multiple movies on different screens, while keeping an eye on a live baseball game via another TV connected to cable. Packet shaping controls the flow of information, much like a water hose splitter that allows you to control the flow of water to the front yard, backyard, and garden all from one spigot.

These tools and others allow us to make the most of the bandwidth that we have, but more important, our instructional practices continue

to be scrutinized and refocused as student needs, and available technologies, change.

One example of this adaptation is our move to adopt a new camera for videoconferencing. Most of our current cameras utilize a videoconferencing appliance that is connected to a large TV. These systems are complicated to set up and to use. Because of this, they inadvertently encourage students to be inactive participants in a videoconference. The systems are controlled by a TV-style remote, and the result is often a “sit back and watch” experience similar to watching TV.

It is not enough to be connected. We want students to interact with others and be engaged. So, we've been on the lookout for technologies that bring students together seamlessly and stay out of the way while students work together and with their teachers. A new 360-degree camera from Owl Labs is a promising option. We have worked quickly to bring this brand-new solution—just released this summer—to our students and communities.

We hope that this new 360-degree conferencing camera and speaker will allow students to sit at tables with their peers and work with each other locally, while communicating with their teacher, who is located far away. Rather than being next to their peers as they “sit back and watch,” they will be drawn in and together around this new piece of tech. No one needs to operate a remote. No one needs to refocus or move a camera. The Meeting Owl camera just works. Onboard processing of the 360-degree video automatically refocuses on the people who are talking. It's new technology such as this that is offering new possibilities for us to better the learning environment.

The bandwidth that we have offers us options. Increased bandwidth will offer us more options. It's that simple an equation for us.

In the book *The World Is Flat*, Thomas L. Friedman describes the internet as a great leveling factor in the world. The internet is the same wherever you go, whether you are in Kodiak or Silicon Valley. Attaining fast and reliable connectivity, paired with the right technology, allows us to offer a better and more personal learning experience for each of our students. With a frontier spirit, we will continue to make things happen for our students. 

Damon Hargraves is director of technology in Kodiak Island Borough School District. He serves on the board for the Alaska Society for Technology in Education.



According to a 2017 Wireless Broadband Alliance report, 23 percent of individuals and families living in urban areas, and 28 percent of families in rural areas, don't have access to or can't afford broadband internet access.