



Hotspots plus laptops appear to improve student performance

by: Jeremy Hegle

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The need to ensure students have both computers and affordable home broadband has become increasingly apparent since the start of the pandemic. Having data to prove this premise is important to making sure access to computers and broadband happens.

Some programs provide laptops to students so they can do their homework. Other programs, such as the [Emergency Broadband Benefit](#), provide subsidies to help pay for internet. Many have questioned the effectiveness of providing only a computer or only internet, as noted in a [special report](#) from *EducationWeek*:

Back about 20 years ago, when Leslie Wilson, the co-founder of the nonprofit One-to-One Institute, started evangelizing for the idea of putting a laptop in the hands of every student, she said superintendents and district officials were loath to spend money on technology for the classroom.

But as districts warmed to technology, Wilson said they started buying laptops with no idea how to effectively use them. She called it the “spray and pray” model: “They spray every kid some type of device and pray that some meaningful learning happens.”

In 2018, Brian Whitacre, a professor at Oklahoma State University, conducted a study to compare the degree to which providing internet in conjunction with a laptop improves educational outcomes for students. According to the recently published [findings](#), “the small randomized controlled trial suggest that simply providing alternative high-school students with Internet access is not enough to have a meaningful impact on student performance over the course of a semester. Rather, a combination of Internet access (hotspots) and tools to take advantage of that access (laptops) are more effective at generating improvements in scholastic achievement.”

I recently interviewed Whitacre about the study. What follows is a summary.

Would you give us an overview of the study?

We worked with an alternative high school to identify 16 students who lacked both computers and an internet connection (beyond a smartphone data plan). We were able to randomly divide up the students into three groups: the first group received just hotspots, the second received hotspots and laptops and the control group received neither and relied on their smartphones to do homework.

After one semester, only those who received both hotspots and laptops had a significant improvement.

Why is this study important?

When we conducted the study in 2018, a lot of the homework gap discussion was only focused on internet availability. To a large extent this is still the discussion when we hear “homework gap.” The study shows that both internet access and device access are necessary.

Don't all schools now provide laptops to students?

A lot do but certainly not all. We point out that it's expensive to give both laptops and hotspots with data plans. That's not going to be feasible for cash-strapped school districts in both urban and rural communities.

Was technical support or digital skills training part of this? Did everyone know how to use the computers?

We actually didn't need to provide them any technical support. It is worth noting that this was pre-pandemic, so the students didn't need to learn how to use online learning platforms. They were using them to search the web, write reports and other things they already knew how to do.

I was surprised when we went to the school and passed around a hotspot for them to look at. By the time the hotspot made its way across the room and I got it back there were five devices connected to it. These students already had the technical skills to use the computers and hotspots.

Did anything surprise you?

Some of the kids really were in tough situations; some were more or less raising themselves at 16 years old, some were in foster homes. The school's principal said how much the devices and hotspots meant to the students. When we spoke to the students after the study, they were very appreciative. When they turned in the devices everything came back in good condition. Based upon our experience I think concerns about loss or damage might be overblown.

Anything else you'd like to convey about this work?

One thing people are concerned about with randomized splits (in a study) is having even distribution of demographic factors that could affect study outcomes. We were pretty lucky when we randomly split students into groups in that they were really evenly distributed (based on demographic factors). We got a very similar breakdown regarding student household income and other factors that could influence how well people will do in school.

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Jeremy Hegle is assistant vice president and Community Affairs Officer (CAO). In this role, Hegle leads the Tenth District's [Community Development department](#) with responsibility for leading and executing the Bank's districtwide community and economic development initiatives, which address challenging issues affecting lower-income individuals, underserved communities and small businesses' access to credit. He also represents the Kansas City Fed on the Federal Reserve System's CAO subcommittee and will manage the Bank's [Community Development Advisory Council](#). Prior to being named CAO in 2023, Hegle led the Bank's digital equity efforts. In 2019 Hegle co-authored [Disconnected: Seven lessons on fixing the digital divide](#), a layperson's overview of the digital divide. He led efforts to narrow the digital divide using three strategies: Expanding access to affordable home broadband. [Collaborating with state broadband directors](#), federal agencies, and local government on broadband deployment strategies and increased access through [affordable internet programs](#). Increasing the supply of low-cost computers by encouraging employers to [donate their used computers](#) to nonprofit refurbishers, schools and community organizations. [Informing banks](#), foundations, government and policymakers of the complex factors that cause the digital divide, the latest research on the topic, and creative solutions to fix it. Hegle joined the Kansas City Fed in 2015. Previously, he served in the Army National Guard and later helped launch KCSOURCELINK, a small-business support organization that links thousands of entrepreneurs with resources to start, grow and accelerate their businesses. Hegle has a bachelor's in business administration and an M.B.A. from the University of Missouri-Kansas City.

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