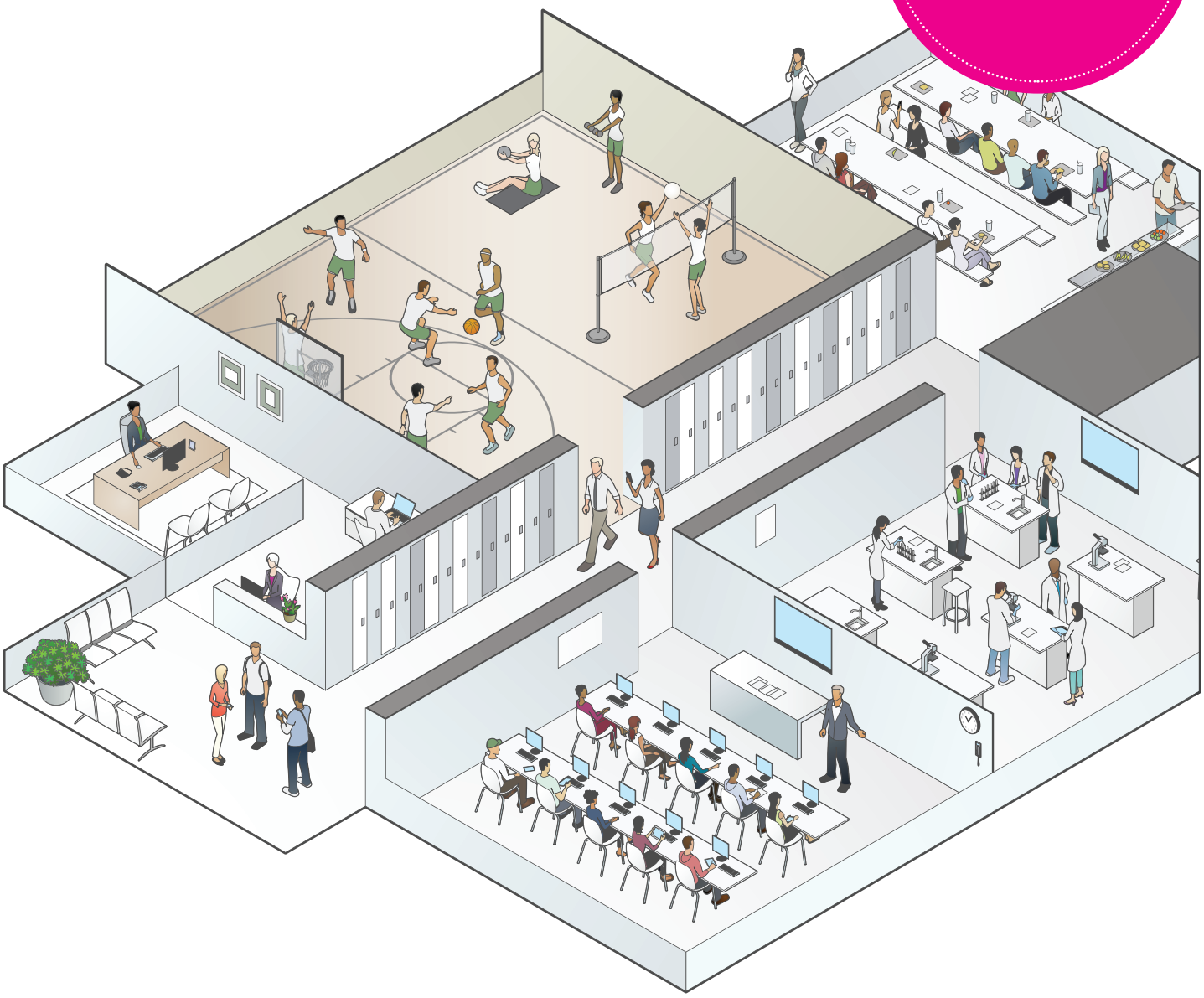
Source One TECHNOLOGY

TECHNOLOGY INSIGHTS

5 Causes of Poor Wireless Access in Schools

(and How to Fix the Problem)

NEW!!
How you can use e-Rate to pay for up to 85% of the cost.



SURVEY RESULTS

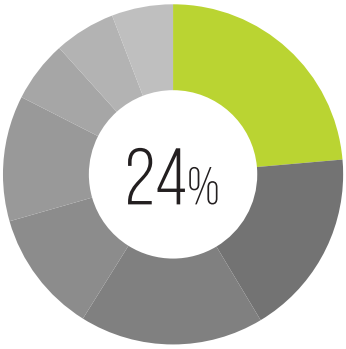
Who says there's a problem?

In October 2016 we asked K-12 educators and school professionals in Milwaukee what the top issues with their school IT were.

It came as no surprise to us that internet and poor wireless access were at or near the top of everyone's list of issues (as was funding). In this guide we'll show you what the main causes of poor performance are, how you can resolve the problems and most importantly, how you can use e-Rate to pay for up to 85% of the cost.

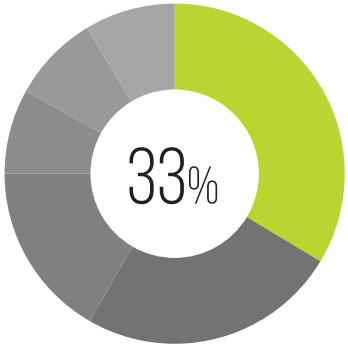
Wireless/Internet access as a **percentage of all issues** raised by role holder

Principals



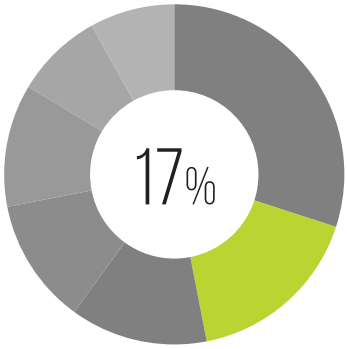
Wireless/Internet access (24%)
Technical staff/training needed (18%)
Poor IT support (18%)
Funding (12%)
Outdated hardware (12%)
Insufficient 1-1 devices (6%)
Time to implement initiatives (6%)
Firewall security (6%)

School IT Techs



Wireless/Internet access (33%)
Insufficient 1-1 devices (26%)
Funding (17%)
Outdated hardware (8%)
Technical staff/training needed (8%)
Poor IT support (8%)

Teachers



Insufficient 1-1 devices (30%)
Wireless/Internet access (17%)
Technical staff/training needed (13%)
Funding (12%)
Outdated hardware (12%)
Poor IT support (8%)
Others (8%)

Based on 150 responses.

CHALLENGES

The drivers of poor performance

1 Inadequate infrastructure

If you're considering purchasing additional Chromebooks, PC laptops, Mac laptops, iPads, or other wireless technology for students and staff, you should first check if your school's infrastructure can support these additional devices.

Infrastructure is what makes up the backbone of your school's networking environment. It includes the size/bandwidth of your Internet pipe, the firewall, the switches, and the access points themselves. Infrastructure is by far, the most critical and important piece relating to how successful your school's technology is used or implemented!

While introducing five new carts of Chromebooks will initially create a great buzz in the school, without solid infrastructure, integrating 150 new laptops will likely result in a disappointing and frustrating experience for both the staff and students. Far too often, schools focus on spending funds on the visible end of technology without taking into consideration if the infrastructure is stable and robust enough to handle the additional load on their wireless network.

Make sure your infrastructure is solid before bringing in additional wireless devices!

2 Not enough access points

When wireless was still in its infancy, access points were deployed sparsely throughout schools buildings because there weren't many devices to support. Unfortunately, with the huge growth of wireless devices found in schools, those days are long gone.

A few of the of factors forcing schools to address demand include:

- Multiple laptop carts
- One wireless device for EVERY student (commonly referred to as 1:1)
- Bring-Your-Own-Device usage models (commonly referred to as BYOD)
- Guest wireless (staff and student phones, etc.)

Schools can no longer get away with minimizing the number of wireless access points deployed in their building IF they want a stable and well-performing wireless solution. That means installing an access point in (nearly) –every- classroom. Along with installing access points in your library, gymnasium, cafeteria, auditorium, or other key areas where you might expect large groups to need wireless access.

Installing enough access points is critical for providing excellent wireless performance and wireless coverage in your school.

3 'Consumer-Grade' access points

Not only is it important to install enough access points in your school, it's equally as important to use 'Enterprise-Class' access points! Don't expect the hardware you find at local retailers like Best Buy to work effectively in your school - these are geared towards home and retail use and won't be good enough!

Keep in mind, your school may be providing wireless access for literally hundreds, or thousands, of wireless devices and connections. A cheap, or entry-level model, access point designed to support 5 or 10 users is going to have disastrous results when deployed in a school environment. If you plan on deploying a good number of wireless devices (Chromebooks, iPads, laptops, etc.) in your school, save yourself a headache and stay far away from brands like D-link, LinkSys, Netgear, or Ubiquiti. If you're relying on those brands, chances are your wireless infrastructure is going to perform poorly during the most crucial times – like when students are attempting to take the state-required **FORWARD/DRC** or **ACT Aspire exams** online!

Consider HPE Aruba, Meraki, Ruckus, etc. as an alternative to store-bought access points. Yes, this means having to pay slightly more (though not as much as you might think!), but the results will be well worth it, and your staff and students will spend more time utilizing technology instead of complaining about technology!

CASE STUDY

"Our wireless system was a mess," recalls **Nathan Mielke, Director of Technology Services at Hartford Union High School**. "Coverage was suspect - there were groups of classrooms in various areas that relied on a single access point - and the speed and performance were awful."

More critically, the school's Google Apps for Education initiative was floundering. Simple tasks, such as typing within a shared Google Doc were painful and unreliable.

Source One Technology got the school up to current wireless standards and addressed both performance issues and coverage with one access point per classroom.

"The solution didn't break the bank, and still continues to serve us well today," says Nathan. "Even our teachers say that wireless connectivity isn't even a thought anymore -- it just works!"

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4 Insecure guest wireless

A standard practice for any school is to create a Guest Wireless network that can be accessed by guest users in their building. This makes it easy to accommodate guest speakers or presenters that need internet access, as well as people who just want to use the internet to check their personal email or quickly pop online.

Guest wireless networks can be a great value-add, but when implemented poorly they can create major security risks for your organization. Remember, those "guest" wireless devices may already be infected with viruses and malware, so isolating those potentially infected devices from the rest of your school network is critical!

How do you isolate guest wireless traffic to keep your school network safe? By implementing industry best-practices and standards and asking your IT staff (or vendor) to follow these basic guidelines: Implement "Access Control Lists" to prevent guest wireless users from having access to your school network where school files/data are located.

Keep the guest wireless traffic segmented on its own network/VLAN – Never configure the guest wireless to use the SAME network as your school network.

Following those two simple steps will create a –SAFE– guest wireless network usable by everyone!

The wireless transformation process at **Whitnall School District**

Growing bandwidth requirements necessitate a fresh look at WI-FI system.

Technology Director, Eric Gran, evaluates internal capability to complete project. Recognises need for external assistance.

(Whitnall) lay out the needs and requirements for the new system.

Source One Technology perform a full assessment of the school's buildings and submit a robust wireless infrastructure design to Whitnall.

On plan approval, Source One Technology build out of the project from setup to backbone modification to completion.

We now have a very robust 802.11 AC WI-FI infrastructure that supports nearly 3,000 mobile devices, 350 traditional computing devices as well as guest network access.

My advice to any school considering a wireless upgrade project? Partner with a vendor who really understands the networking needs of schools and who keeps you informed and involved throughout the project.

Eric Gran

TECHNOLOGY DIRECTOR
WHITNALL SCHOOL DISTRICT

CASE STUDY

Carmen Schools of Science & Technology's aim of elevating learning with technology was being hindered by poor connectivity and reliability of the network. **IT Director, Carol Hughes**, complimented her own investigation into the problem with support from Source One Technology who helped improve core stability.

For better wireless access they replaced the existing Fortinet and Motorola equipment with HPE Aruba wireless technology. Despite having the same set of features as other competitors, it was nearly 50% cheaper and came with a lifetime warranty.

The backbone of the network is now solid and not having to worry about network and wireless issues has released time for Carol, while significantly enhancing her peace of mind.

"Getting the underlying infrastructure right is critical," says Carol. "For schools, there's no point in introducing new Chromebooks into the classroom if you regularly have problems accessing the network."

5 Outdated Device Drivers

One of the most common problems with intermittent, random, or spotty wireless connections is having outdated Device Drivers installed on a laptop.

All laptop vendors, regardless of brand, make, or model, provide updated wireless Device Drivers that are published and made available to the public on a regular basis - sometimes as often as several times a year. If your laptops are experiencing quirky connections, slow speeds, or some other goofy anomaly that can't easily be explained, ask your school IT department to verify your laptop's wireless device drivers are updated and current.

This is one of those often overlooked quick-fixes that IT technicians forget to check when an individual user is having wireless connectivity problems. Even if an access point is nearby, or in the same classroom, old outdated device drivers on a laptop can severely degrade performance and overall usability.

So when in doubt, ask your IT department to update the wireless device drivers on your laptop!

FUNDING

E-Rate to the rescue!

Your out-of-pocket expenses for replacing your school wireless can be substantially reduced by participating in the federal e-Rate program for Category 2 expenses.

ALL schools are eligible to participate in this program and anywhere from 20-85% of your school's wireless costs can be subsidized by e-rate, depending on your level of Free and Reduced students participating in the National School Lunch Program.

The following table shows your discount percentage depending on if your school is Urban or Rural.

Income	**Category 2 (C2)**	
Measured by % of students eligable for the National School Lunch Program (NSLP)	URBAN Discount	RURAL Discount
Less than 1%	20%	25%
1% to 19%	40%	50%
20% to 34%	50%	60%
35% to 49%	60%	70%
50% to 74%	80%	80%
75% to 100%	85%	85%

Your school will receive funding/reimbursement at the rate of $150 per student. So for example, if your school has 300 students, you will have $45,000.00 made available to you through the federal e-Rate program.

What will e-Rate cover?

The federal e-Rate program will cover even MORE than just your wireless under Category 2 expenditures. Schools are allowed to request federal e-Rate funding for any of the following equipment:

Federal e-Rate Program Category 2 Allowed Equipment:

- Wireless Controller and Access Points
- Network Switches and Routers
- UPS Battery Backups
- Cabling and Racks
- Caching Devices
- Installation and Configuration Services

What does this mean? It means that not only are the cost of the wireless Access Points fundable through e-Rate, but so are the Network Switches, UPS Battery Backup Units, Cabling, and even the overall Installation and Configuration services that might be required to set everything up!

All of this adds up to ($$) Substantial Cost Savings ($$) for your school in an effort to improve the overall technology and wireless experience found within your organization.

More information about the federal e-Rate program can be found here: http://www.usac.org/sl/about/getting-started/default.aspx.

MORE RESOURCES

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To find out how we can help you save time and money on frustrating wireless network issues, call **(262) 993 2231** or visit **www.sourceonetechnology.com**.