EdTech Leadership Survey Report

2022

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Contents

Introduction

Since 2013, CoSN has conducted an annual national survey on U.S. K-12 IT Leadership. While the landscape has always changed over time, the impact of an ever-evolving global pandemic has been unique and profound. The pivot to remote learning in 2020 had a dramatic impact on the roles and responsibilities of IT Leaders, including off-campus 24/7 support for teachers, staff, students, and parents. Even districts with pre-existing, pre-pandemic 1:1 implementation struggled with the new demands. To gain deeper insight into the ongoing challenges, the 2022 survey expands sections on cybersecurity, interoperability, and procurement. A question on the respondents' age range also made a debut. Looking at those responses, along with responses on changed retirement plans, we hoped to learn if there is now or soon will be a pandemic "great resignation" effect on school system IT Leaders.

As in prior years, this report on survey responses is intended to give our community a national perspective on challenges and successes. CoSN also uses the survey results in making resource development decisions. Existing CoSN resources include:

- The Digital Leap Success Matrix — An outline of the practices needed to perform as a successful digital school system
- Peer Reviews — A rigorous process for assessing a school system's digital readiness, based on CoSN's Digital Leap Success Matrix
- The Digital Equity Toolkit — A guide to closing the Homework Gap and ensuring digital equity, including our new Student Home Connectivity research
- Interoperability Toolkit — Resources to help districts increase the interoperability of their academic and operational systems

- Student Data Privacy Resources — A range of resources to help districts build and improve their privacy programs, including an in-depth guide to key federal student data privacy laws, as well as the Trusted Learning Environment Seal

- Cybersecurity Resources — A suite of resources defining risks and providing strategies for addressing cybersecurity challenges

- Trusted Learning Environment (TLE) —The TLE Seal program is designed to help K-12 schools and districts build strong, effective privacy programs and a culture of trust and transparency with 25 essential privacy practices

- Network & Systems Design — A suite of resources to help schools and districts design their technology to adapt to shifting and sustainable technologies that support the increasing demands of teaching and learning

- EmpowerED Superintendent Toolkit — Created in partnership with AASA, The Superintendents Association, the toolkit provides leadership strategies based on imperatives for technology leadership and action steps for strengthening the technology leadership team. Resources in the toolkit include:
    - EmpowerED Superintendent Critical Focus Areas: Issues One-Pagers
    - Self-Assessments for Superintendent, CTO, District Leadership Team
    - Financing Technology Innovations: Strategies and Tools for Determining 1) Total Cost of Ownership and 2) Value of Investments

- Driving K-12 Innovation — A series of annual reports on key trends around emerging technologies to transform learning organized around Hurdles, Accelerators, and Tech Enablers

- Digital Equity — A range of resources to inform and support digital equity initiatives to close the Homework Gap.

In addition to these public resources, CoSN provides members with extensive member-only resources, such as the ASBO/CoSN Toolkit for collaboration between the school business official and CTO. Plus, CoSN issues Member Exclusive Briefs that provide guidance on key emerging topics, such as addressing screen time concerns, as well as EdTechNext reports on emerging technologies like AI in education and Low-Cost, High-Impact Technologies to Address Digital Equity.

The full breadth of CoSN resources are available online. Note: Many of the resources are available to non-members as well as members, with a CoSN account required to download.

Key Findings

Cybersecurity: K-12's Five Alarm Fire.

Cybersecurity continues to be the top priority for IT Leaders. End-user training and training for IT staff are the major strategies used for combating cybersecurity threats. However, IT Leaders continue to underestimate the risks to their systems. When asked about perceived threats, the most common rating for any threat was either medium risk or low/medium risk. Despite cybersecurity warnings from multiple government agencies that K-12 schools are being targeted for ransomware attacks,[1] ransomware was rated high risk by only 8% of respondents. This may help explain why relatively few districts (21%) reported a dedicated full-time equivalent (FTE) employee to oversee cybersecurity.

Pandemic Impact.

The pandemic is changing K-12 IT priorities. Capacity to run video conferencing software has become a mandatory requirement for new device purchases used in education. While challenges to video conferencing persist, they are being reported at lower rates than last year. More than three-fourths of respondents are prioritizing devices that are Wi-Fi 6 enabled and the vast majority have replaced BYOD (bring your own device) strategies with school-provided 1:1 strategies, even in the elementary grades. To address off-campus connectivity, most districts are now providing district-owned Wi-Fi hotspots for students who lack connections at home. Providing support for home access put strains on the financial and human resources of IT departments. More than half of respondents were understaffed in their ability to provide remote support to students and families. This is likely one of the issues contributing to the 12% of responding IT Leaders who are planning to retire early because of the pandemic.

[1] https://www.cisa.gov/uscert/sites/default/files/publications/AA20-345A_Joint_Cybersecurity_Advisory_Distance_Learning_S508C.pdf

Modernized Infrastructure.

Most districts responded that their networks are increasingly built for speed. Only 19% report the relatively slow speeds of 100Mbps or less between their WAPs and LAN. Single sign-on (SSO) is the most-implemented interoperability initiative, with many IT Leaders reporting they are taking multiple steps to advance data interoperability in their district. The majority of respondents are helping to manage their digital ecosystems by putting into place processes for integrating free tools, including using an “approved apps” list. However, hurdles exist for system-wide improvements. The number one technology challenge is the budget. Likely related to the budget are the challenges that tied for the number two slot — lack of available professional development (PD) and the inability to hire skilled staff. IT Leaders also struggled with creating a district-wide data strategy, citing the lack of understanding by instructional leaders as the most common reason.

IT Leader Profiles.

IT Leaders are still overwhelmingly white and predominately male. A slight majority of men come to their position with a technical background, compared to less than a quarter of women. Conversely, nearly three-quarters of women IT Leaders have professional backgrounds in education compared to less than half of men. Most IT Leaders are in their forties and fifties and while there’s the expected correlation between age and number of years to retirement, the percentage of those planning to retire in the next five years is a significant 31%. Of those, a somewhat surprising 9% are IT Leaders currently in their forties planning to retire. When it comes to salaries, there’s a distinct metro divide. IT Leaders working in towns and rural districts are largely in the lower end of salary ranges and largely missing at higher end.

IT Leader Profiles

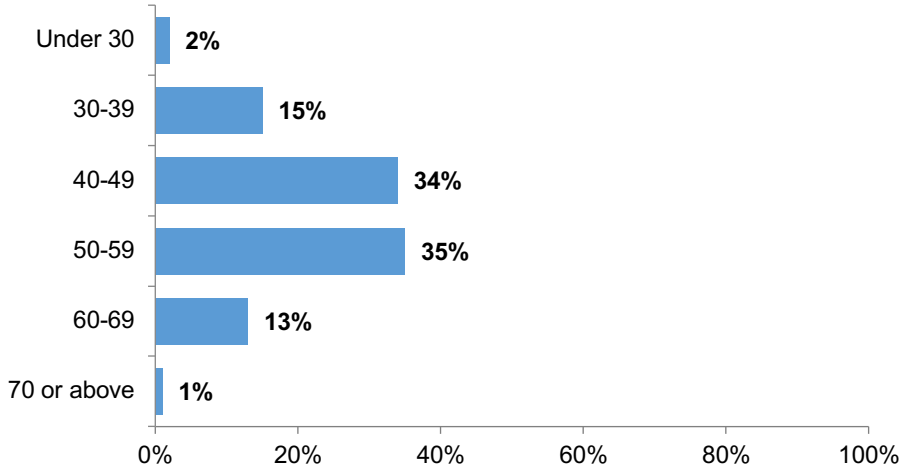
There appears to be an uptrend in women holding IT Leader positions over the past three years, increasing to more than a third (34%) in 2022 compared to a quarter (25%) in 2020. However, men continue to comprise the majority (64%) of respondents.

TABLE: IT Leadership Segmented by Female/Male

	2020	2021	2022
Female	25%	28%	34%
Male	75%	72%	64%
Prefer not to answer	____	____	2%

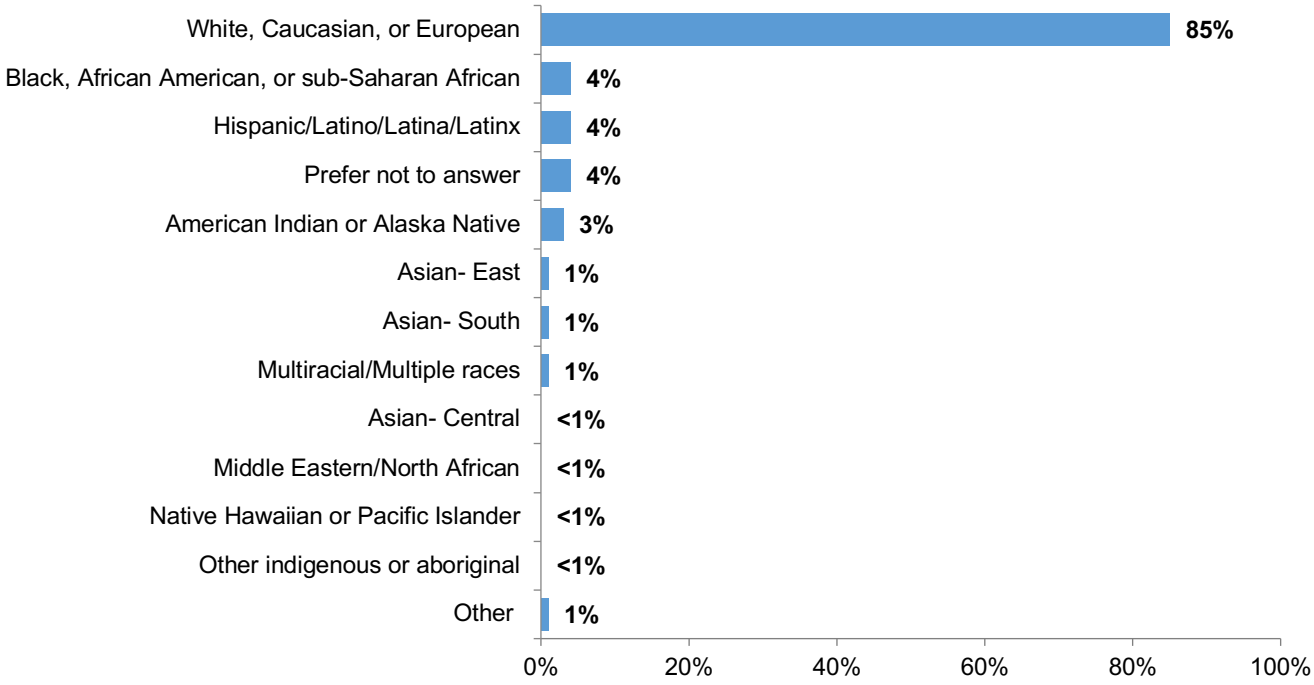
New in the 2022 survey was a question about age of the education IT Leader. The large majority (69%) of IT Leaders are in the peak career age (34% in their forties and 35% in their fifties). Not surprisingly, the smallest percentages were at the outermost ends of the scale—only 2% of IT Leaders are under 30 and only 1% are 70 or above. IT leaders in their thirties accounted for 15% and those in their sixties accounted for 13%.

IT Leadership Segmented by Age



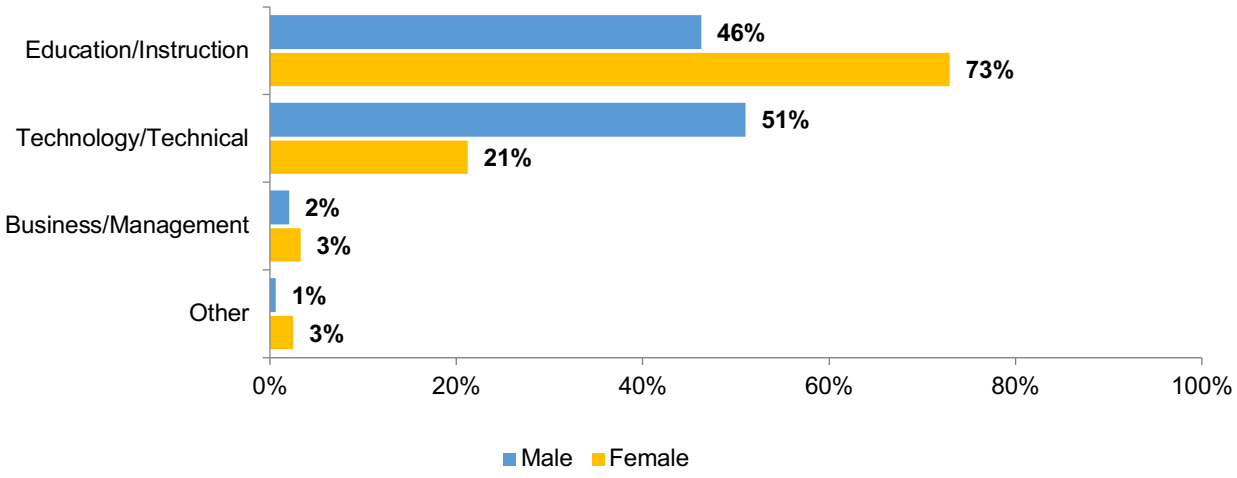
School systems' IT Leadership continues to lack racial and ethnic diversity. The vast majority (85%) identify as White, Caucasian, or European. The next largest categories of respondents, each with 4%, identify as Black, African American, or Sub-Saharan African, and Hispanic/Latino/Latina/Latinx. Another 4% of respondents preferred not to identify. This year, less respondents indicated they are White than in the prior year. However, the survey this year had an expanded list of race and ethnicity categories from which respondents could identify. This might be the cause of the reduced percentages rather than an actual reduction in the percentage of IT Leaders who are White. The 2023 survey results, using the same criteria as 2022, will allow for a year-over-year apples-to-apples comparison on diversity.

IT Leadership by Race & Ethnicity



The majority (55%) of respondents described their primary professional background as Educational/Instruction. IT leaders coming to their position from a Technology/Technical background comprise 41%. The remainder of respondents have a Business/Management background (3%), or other competencies (1%) not listed on the survey. However, men and woman generally come to the position following different paths. Women overwhelmingly (73%) come from an Education/Instruction background. Men are more evenly split with slightly more than half (51%) having a technical background, and a little less than half (46%) having an education background.

Primary Professional Background Segmented by Male/Female

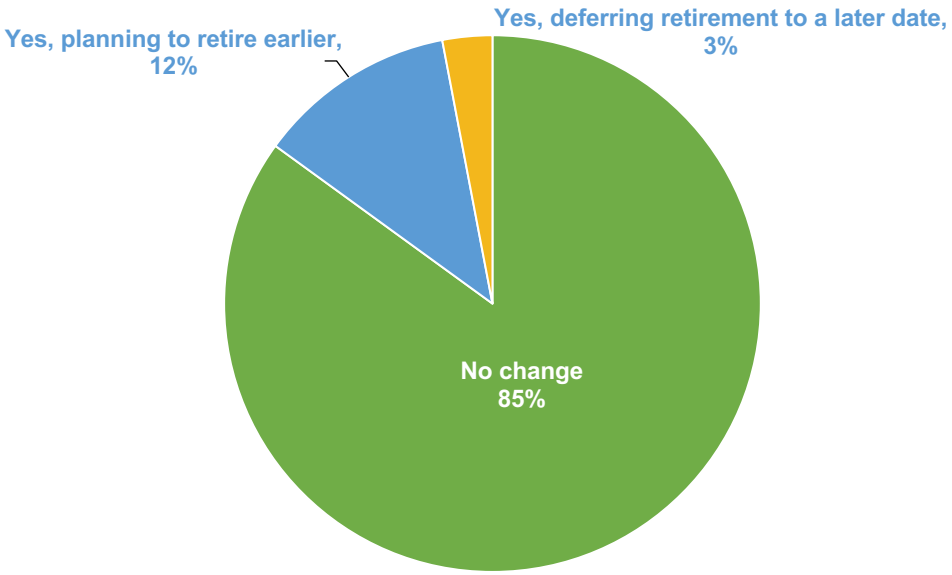


For many Americans, the "great resignation" started by the pandemic could more accurately be described as the "great retirement."[2] Early retirements in education were also identified as an issue in CoSN's 2020 Driving K-12

[2] https://www.forbes.com/sites/avivahwittenbergcox/2021/11/16/the-great-resignationactually-a-mass-retirement/?sh=ae20f6718ba1

Innovation report.[3] The early retirement rate for teachers is “alarming,” according to the National Education Association which reports that 53% of teachers are planning to retire earlier than planned.[4] K-12 IT Leaders are also retiring earlier but with 12% saying the pandemic influenced their decision just not to the same extent as teachers. The vast majority (85%) of respondents made no changes in their retirement plans and a hardy few (3%) are deferring their retirement to later date due to the pandemic.

Has the Pandemic Changed Your Retirement Plans?

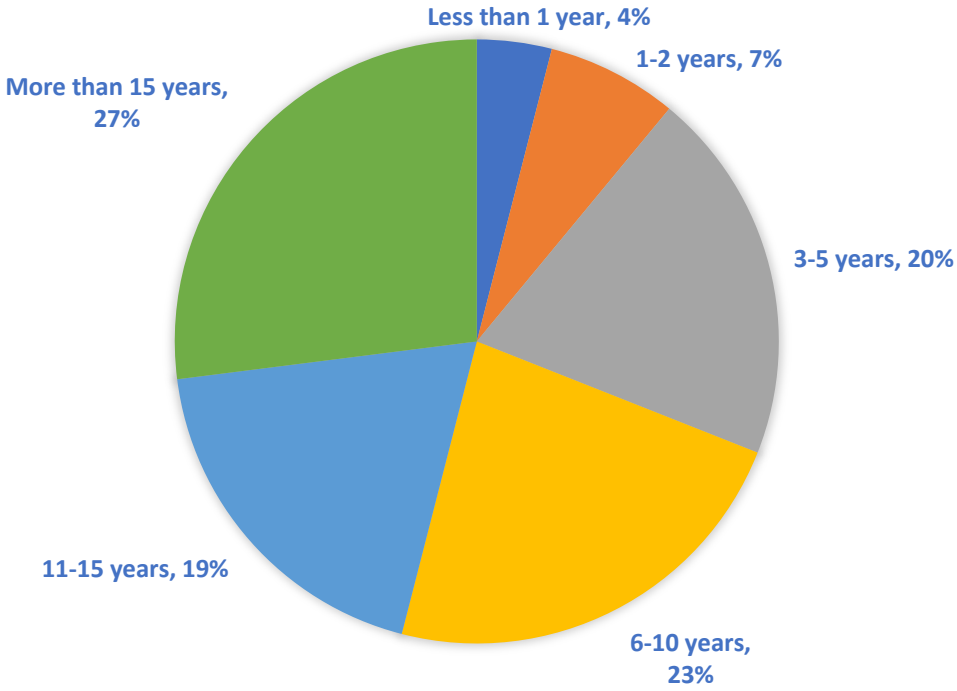


[3] https://www.cosn.org/edtech-topics/driving-k-12-innovation/

[4] https://www.nea.org/about-nea/media-center/press-releases/nea-survey-massive-staff-shortages-schools-leading-educator

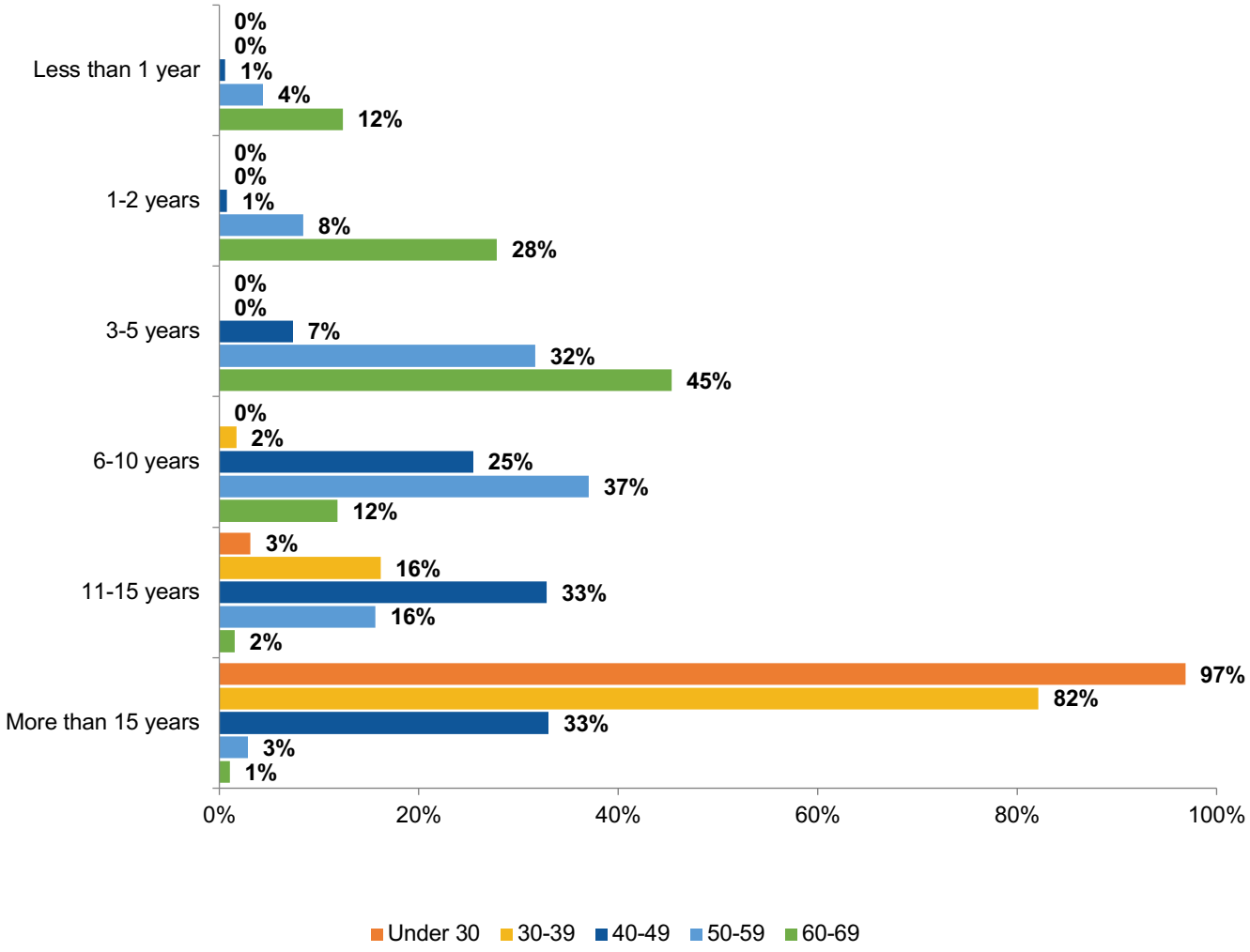
Eleven percent (11%) of IT Leaders plan to retire in two years or less. The percentage of those planning to retire in the next five years is 31%. The majority (54%) of respondents are planning to retire within the next ten years. The remainder (27%) of IT Leaders that are planning to retire in more than 15 years.

When Do You Plan to Retire?



Not surprisingly, we see a correlation between age and retirement plans. The older the IT leader, generally the closer to retirement. However, a somewhat surprising 9% of forty-year-olds are planning to retire in the next five years. In ten years, 97% of IT Leaders in their sixties plan to be retired, compared to just 2% of those currently in their thirties. The vast majority (82%) those in their forties plan to retire in more than 15 years, as do 97% of the under-30 crowd.

Retirement Plans Segmented by Age



Staffing

Most respondents said their districts were understaffed for two IT functions that have direct impact on teaching and learning: providing instructional support around classroom use (52%) and providing remote support to students and families (51%). A plurality (46%) of respondents reported insufficient staff for integrating technology in the classroom. Increasing reliance on technology for services not connected to instruction have expanded the list of IT responsibilities. Increased responsibilities on other more administrative technologies likely impact a department's ability to focus on student-facing technology—

> *"Everything is moving to a networked solution—alarm systems, doors, and even HVAC are now the responsibility of the IT department because it is networked but our staff has not increased to keep up with the demand."*
>
> Survey Respondent

While no IT function received more than 1% of respondents indicating they were overstaffed, of the eleven IT functions asked about on the survey, nine were reported as having adequate staffing by a majority of respondents. Installing applications has the best staffing rate with 85%, including the 1% of respondents who were overstaffed in this area. Application maintenance with 79% and network system maintenance with 75% received the next highest rating of adequately staffed/overstaffed. The other IT functions that were rated adequate/overstaffed by a majority of respondents were: meeting department's yearly objectives (75%), effectively supporting needs of school/district (62%), providing remote support to teachers and administrators (66%), planning and implementing new technology (58%), and support ing device cleansing protocols (58%). While IT departments recognize their challenging staffing issues, it does not mean they stopped trying to do what is needed. Many respondents used the survey to comment on the hard work of their tech team, including one who put it this way—

> *"Our district is blessed to have the staff of technologists that we have. They were and continue to be heroes each and every day."*

TABLE: Staffing Levels by IT Function

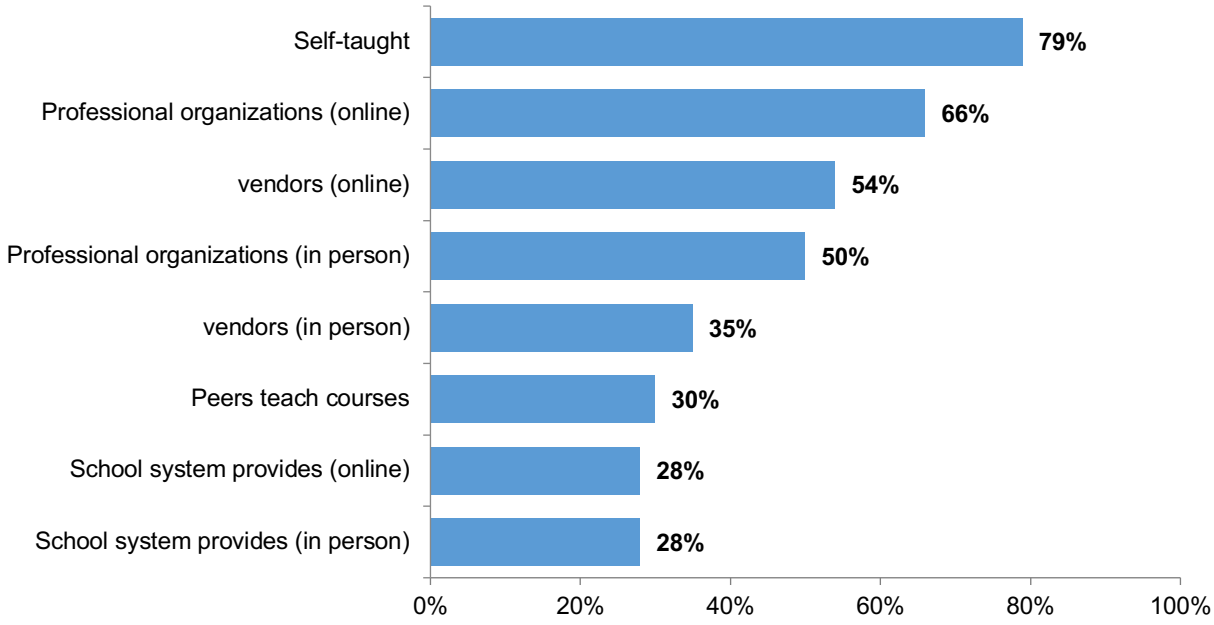
IT Function	Understaffed	Adequate	Overstaffed
Provide instructional support around classroom use	52%	47%	1%
Provide remote support to students and families	51%	49%	0%
Integrate technology into the classroom	46%	53%	1%
Support device cleansing protocols	42%	58%	0%
Plan and implement new technology	41%	58%	0%
Effectively support the needs of the district/school	39%	61%	1%
Provide remote support to teachers and other educators/administrators	35%	65%	1%
Meet your department's yearly objectives	26%	74%	1%
Maintain network systems adequately	25%	74%	1%
Maintain applications	22%	78%	1%
Install applications	15%	84%	1%

Professional development (PD) is critical to a technology department's ability to manage the ever-increasing scope of responsibilities and the diversity of technologies in their district. To get a better understanding of how IT Leaders addressed PD, a question was added to this year's survey— "How does your IT department receive its professional development?" The results show a variety of methods are employed, with self-taught being the most common (79%). This makes sense, as due to the rapid pace of technology changes self-directed learning is common for IT professionals and online resource are readily available to address knowledge gaps for immediate trouble-shooting needs. However, as one respondent advised—

> *"IT personnel training needs to be emphasized more and encouraged more. I know of too many districts that view their IT personnel as people who can 'learn on their own' as opposed to needing conferences, workshops, etc. "*

A majority (66%) of respondents also use online PD offered by professional organizations and 54% use the online PD offered by vendors. The popularity of online PD from trusted sources is not surprising, especially considering pandemic distancing protocols and travel cost avoidance. However, in-person PD was still popular, with half of the respondents (50%) attending in-person training offered by professional organizations and more than a third (35%) attending vendor in-person training. Less than a third (30%) receive peer-to-peer PD. School-system-provided training, whether online or in-person, was the least-employed method, each used by 28% of respondents.

How Does Your IT Department Receive Its Professional Development?



While the question about salary had a relatively large percentage of opt-outs, the responses provided make apparent a metropolitan/non-metropolitan divide. In rural areas and towns, 59% of the IT Leader salaries are under $100K, including 48% of salaries under $70K. Towns have more IT Leaders (62%) earning under $100K than their rural counterparts but with less (42%) earning under $70K. This compares to suburban areas where a quarter (25%) earn less than $100K, including 15% under $70K, and urban areas where 20% of IT Leaders earn under $100K, including just 13% under $70K. A distinct metro divide is also seen in looking at the highest salary ranges. Only 2% of IT leaders in rural environments and 4% of those in town earn at least $130K, as compared to 24% of those in suburban districts and 31% in urban districts. Respondents from Urban districts were the only segment to report salaries more than $200K (2%).

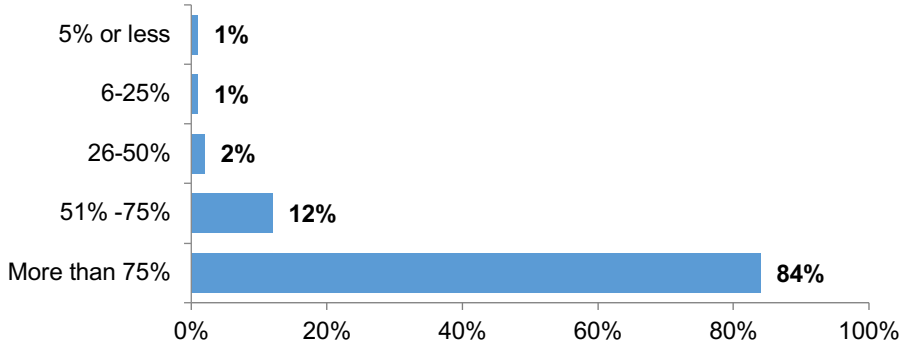
TABLE: IT Leadership Salary by Metro Status

Annual Salary	Rural	Town	Suburban	Urban
Under $70K	48%	42%	15%	13%
$70K-99,999K	11%	20%	10%	7%
$100K – 129,999K	8%	11%	29%	26%
$130K – 159,999K	2%	4%	18%	17%
$160K – 200K	0%	0%	6%	12%
More than $200K	0%	0%	0%	2%
Did not provide	31%	24%	21%	23%

Devices

More than three-quarters of devices on the network are district-owned for an overwhelming majority (84%) of respondents. Only 4% of IT Leaders work in districts where district-owned devices comprise 50% or less. These results indicate that the BYOD initiatives of past years have largely been abandoned.

What Percentage of District-Owned Devices Are on The Network?



Most districts have implemented 1:1 programs across all grade levels. The middle schools have the highest rate of implementation with 86%, followed by high schools with 83%. These percentages represent a significant increase in implementation since 2020, when this question last appeared on the survey. While middle schools still had the most 1:1 implementation two years ago, the rate was 69%. High schools were at 66%. Greater increases occurred in elementary schools. This year, 1:1 implementation at grades 3-5 is 81%, closely mirroring that of high schools. The implementation rate for grades K-2 is 73%. While a direct comparison to the 2020 results is not possible for the elementary school results as they were not segmented by grade level in prior years, the combination of grades K-5 had a 43% 1:1 implementation rate. The contrast in results between the two surveys shows a dramatic overall movement towards increased 1:1 in the elementary grades. It is important to look at the 2020 results from respondents for whom 1:1 was a goal. The 21% of respondents who were planning for 1:1 in their middle schools and the

23% planning to implement in their high schools roughly match the gains reported this year. The 30% in 2020 who were planning to implement 1:1 at the elementary school level appear to have succeeded as well.

TABLE: 1:1 Goals by Grade Level

	2022			2020		
School Level	Already Implemented	Goal	Not a Goal	Already Implemented	Goal	Not a Goal
High School (grades 9-12)	83%	8%	9%	66%	23%	11%
Middle School (grades 6-8)	86%	8%	6%	69%	21%	10%
Elementary (grades 3-5)	80%	11%	9%	43%	30%	30%
Elementary (grades K-2)	73%	13%	15%			

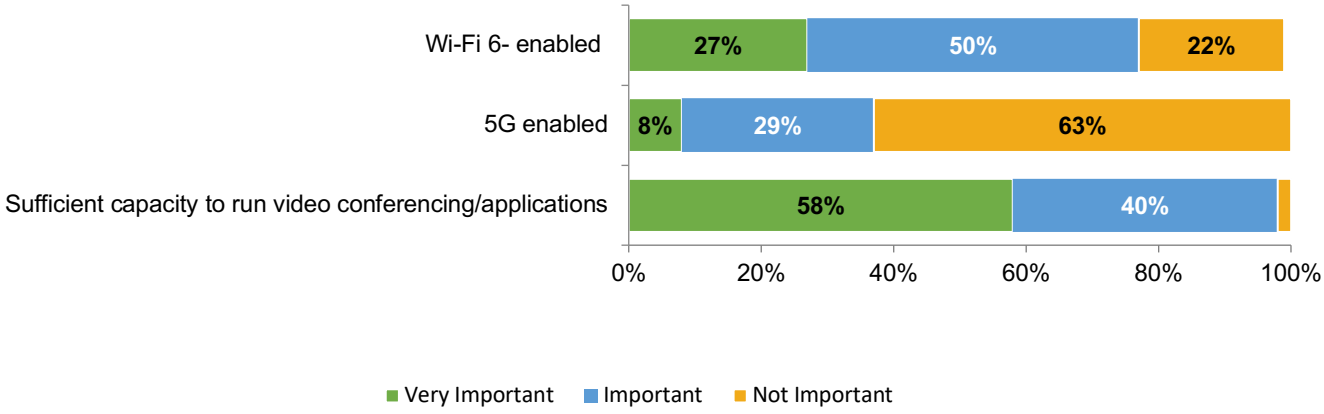
When asked to rate the importance of features for new or refreshed devices, the overwhelming majority (98%) said sufficient capacity to run video conferencing applications was important, including 58% who said it is very important. This result is not unexpected due to the reliance on video during remote learning. This data reinforces the finding in CoSN's Student Home Connectivity Study, which looked at 750,000 students in 13 school districts and found that 87% of bandwidth by students learning from home was for video.[5]

Wi-Fi 6 enabled capability is also a priority, with 77% saying it was important, including 27% who felt it was very important. Less than a quarter (22%) of respondents rated 6G as not important. This compares to 5G connectivity, where a majority (63%) rated it as not important. As device purchases are

[5] https://www.cosn.org/tools-and-resources/resource/student-home-connectivity-study/

traditionally on a 5-year cycle, prioritizing devices that will be able to take advantage of the faster Wi-Fi speeds enabled by 6G is a good procurement strategy.

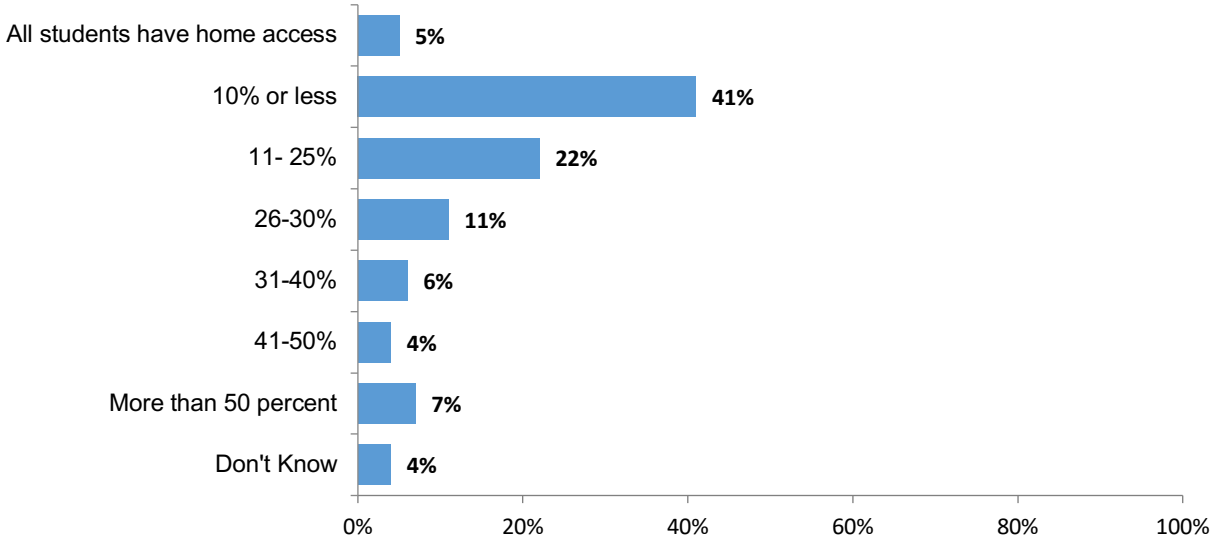
When Buying New Devices/Refreshing Devices, Please Rate the Degree of Importance of The Following Features.



Equity

Only 5% of respondents work in districts where all their students have adequate broadband access at home and only 7% where most of their students have adequate access at home. The relatively good news is that 41% of districts report only 10% of their students don't have access to broadband at home. Districts where 31-50% of students don't have home broadband account for a tenth (10%) of respondents. Districts where 11-30% of students don't have home access account for a third (33%) of districts. The bad news is all these percentages translate into thousands of students with limited or no access for remote learning. Hence, the Homework Gap persists despite considerable progress having been made.

Percentage of Students Without Broadband Access at Home



There are several barriers to students accessing remote instruction from home. Connections that are too slow for multiple users in the household was the number one problem, according to IT Leaders. During the pandemic, students were competing with their own siblings and parents for access over Wi-Fi and their routers could not keep up with the bandwidth demand. Ranked second was the inability of families to get access to the internet because of location. According to the FCC, this affects 19 million Americans, including more than 14 million in rural areas.[6] Internet service that is too expensive for families was ranked as the third major challenge. Note that the United States is grouped among the countries with the highest cost for mobile data—138 on a list of 155, from cheapest to most expensive.[7]

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[6] https://www.fcc.gov/reports-research/reports/broadband-progress-reports/eighth-broadband-progress-report

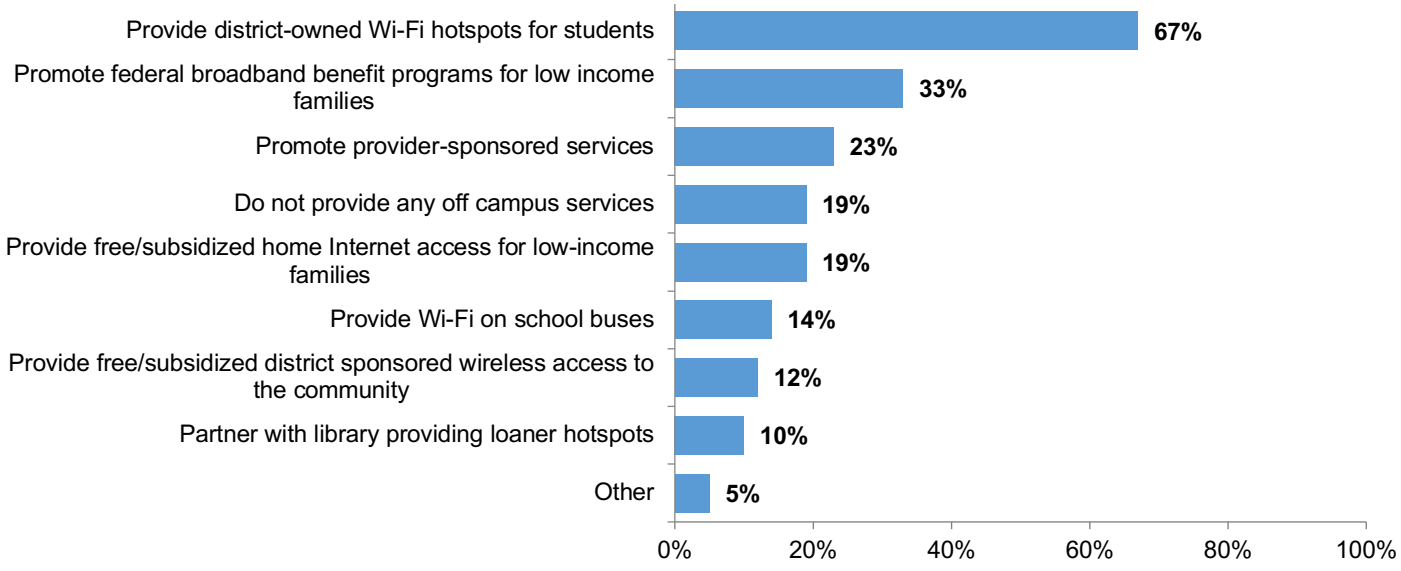
[7] https://www.visualcapitalist.com/cost-of-mobile-data-worldwide/

TABLE: Challenges related to students' access to technology at home

Rank	Challenge
#1	Students' internet connection is too slow for multiple users at once
#2	Families can't access internet at home due to location or lack of broadband infrastructure
#3	Internet service is too expensive for families

The vast majority (81%) of districts employ a variety of strategies to help students access broadband at home. With 67%, the most popular method is providing Wi-Fi hotspots. However, some respondents commented that LTE hotspots in some regional areas have been ineffective, and the coverage was less than advertised. Another 10% of districts partner with libraries to provide loaner hot spots. A third (33%) promote federal broadband benefit programs for low-income families, 24% promote provider-sponsored services at reduced monthly rates, and 19% provide free or subsidized access to low-income families directly. Fourteen percent (14%) of districts provide Wi-Fi on school buses, 12% provide free or subsidized wireless access to the community, and 5% use other strategies not specified on the survey.

Off-Campus Strategies for Increasing Broadband Access



Cybersecurity

Only a fifth (21%) of districts have a full-time equivalent (FTE) employee dedicated to network security, the same percentage as the prior year. This means that cybersecurity protection is a part-time responsibility in a large majority of school districts. The lack of human capacity around cybersecurity is surprising given that for five years in a row, respondents have ranked it as the highest IT priority. In lieu of a full-time cybersecurity position, districts address cybersecurity in a variety of ways. A third (33%) of districts include the responsibility as part of another job. This is virtually the same as the prior year's 34%. The results for ad hoc (8%) and "other" (3%) strategies also closely mirrored last year's results. However, significant change is seen in the reduction of the shared-responsibility approach in which cybersecurity functions are carried out by more than one employee. This year, only 34% structured cybersecurity management in this way compared to 53% the prior year. More districts have implemented outsourcing strategies instead. Outsourcing (using an external service to manage cybersecurity) is used by 21% of districts (7% to a public service organization through local or state government or public college/university), or to a school district entity (through a regional education service district or cooperative) and 14% to a private sector provider). In 2021, just 6% of districts outsourced. As cyber-attacks become more sophisticated, greater expertise is needed to combat them and the demand for those skills also increases. Globally, there is a cybersecurity skills shortage with "more cybersecurity job openings than qualified candidates to fill them."[8] As school districts will be hard pressed to offer salaries that compete with the private sector for the small pool of cybersecurity expertise, it is likely that the use of outsourcing solutions will grow. Regardless of whether a district uses an insource or an outsource strategy, districts need more funding to keep their networks secure. Cost

[8] https://www.issa.org/wp-content/uploads/2021/07/ESG-ISSA-Research-Report-Life-of-Cybersecurity-Professionals-Jul-2021.pdf

estimates for next-generation firewalls and other features needed to increase U.S. districts' network security are over $2.4 billion dollars.[9]

Table: Network Security Monitoring Strategies (without dedicated person)

Monitoring Method	2022	2021
Shared responsibility across several jobs	34%	53%
Part of another job	33%	32%
Outsource—private sector service provider	14%	6%
Outsource—public service or school district entity	7%	
Ad hoc, not assigned a job function	8%	6%
Cybersecurity ½ FTE	0%	*
Other	3%	3%

* not included on 2021 survey

Practices to improve cybersecurity

The most frequently-used methods for improving cybersecurity are IT staff training (65%) and end-user training (63%). While it would be better if these percentages were 100%, it is a good sign that the percentages closely align. It suggests that most districts recognize that cybersecurity is not just the purview of the IT department—as the U.S. Cybersecurity & Infrastructure Security Agency advises, "It's going to take all of us to really protect the systems we all rely on."[10] Most districts (55%) employ the best practice of offsite backups and 54% encourage staff to upgrade their password, another best practice. Increasing the number of characters in a password from eight to twelve characters increases the time a supercomputer needs to brute-force crack a password from minutes to *centuries*.[11]

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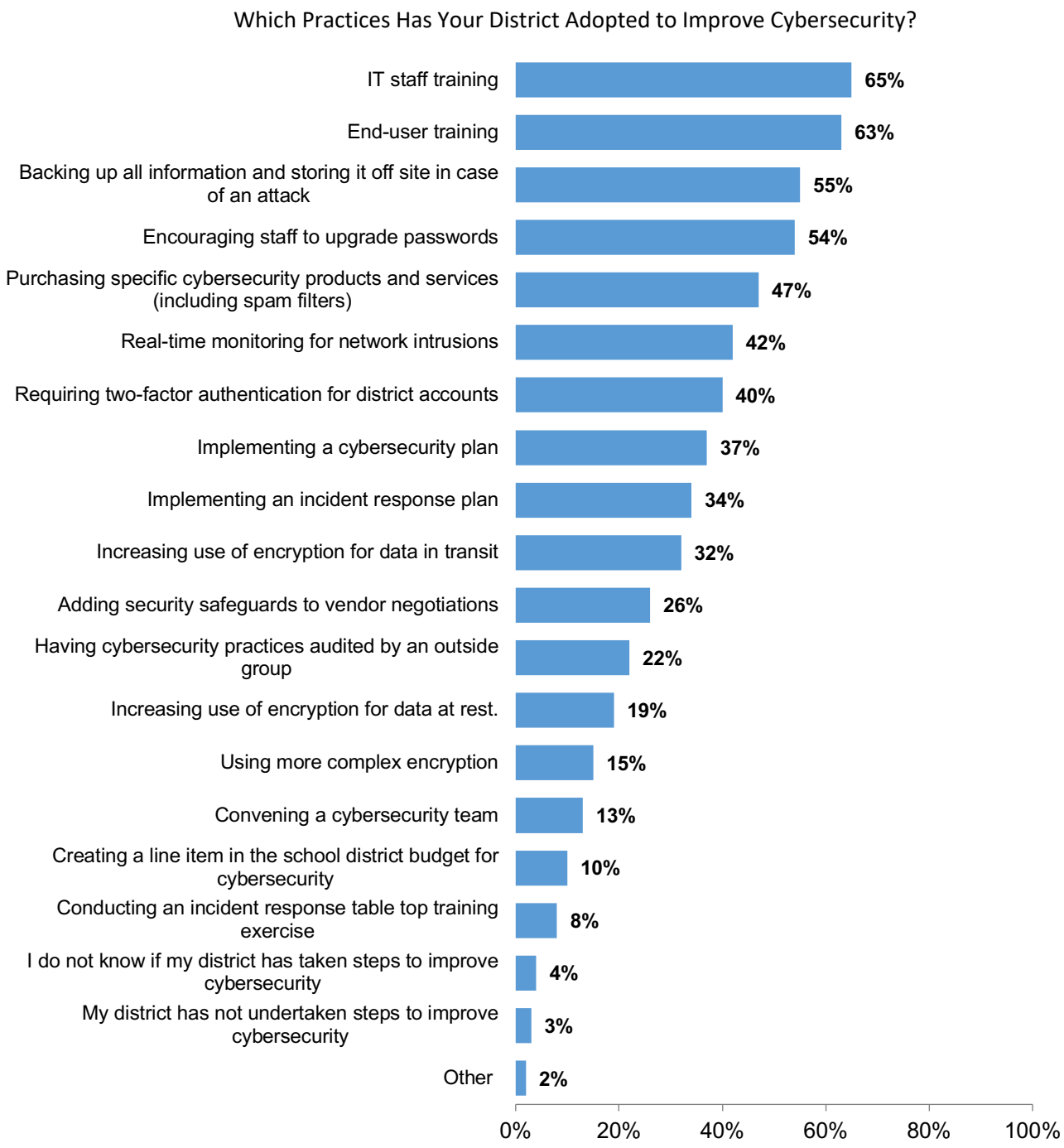
[9] https://emma-assets.s3.amazonaws.com/paqab/0d06153c299fd09df713071630f201df/CoSNFFL_Cybersecurity_Review_January_2021.pdf

[10] https://www.cisa.gov/shields-up

[11] Firewalls Don't Stop Dragons, Fourth Edition, Cary Parker, Apress, p.109.


Which Practices Has Your District Adopted to Improve Cybersecurity?
IT staff training
65%
End-user training
63%
Backing up all information and storing it off site in case of an attack
55%
Encouraging staff to upgrade passwords
54%
Purchasing specific cybersecurity products and services (including spam filters)
47%
Real-time monitoring for network intrusions
42%
Requiring two-factor authentication for district accounts
40%
Implementing a cybersecurity plan
37%
Implementing an incident response plan
34%
Increasing use of encryption for data in transit
32%
Adding security safeguards to vendor negotiations
26%
Having cybersecurity practices audited by an outside group
22%
Increasing use of encryption for data at rest.
19%
Using more complex encryption
15%
Convening a cybersecurity team
13%
Creating a line item in the school district budget for cybersecurity
10%
Conducting an incident response table top training exercise
8%
I do not know if my district has taken steps to improve cybersecurity
4%
My district has not undertaken steps to improve cybersecurity
3%
Other
2%
0%
20%
40%
60%
80%
100%

Half of districts (50%) require training for teachers and staff and another 22% are planning to do so. Districts that require or plan to require administrator and support staff training account for 17%, and only 5% either require or plan to require only teachers to be trained. The most alarming result is that 30% of districts don't require *any* cybersecurity training for their teachers, administrators, or staff. Social engineering attacks are well-known threats. Most cyber-attacks succeed because attackers understand human behavior. We tend not to notice small typos in a weblink or in the email address from an authority figure. Employees who are not trained to be on the alert for these types of deceptions or who are unfamiliar with other cybersecurity best practices, increase vulnerability to cyberattacks.

TABLE: Training on Cybersecurity Practices

Trainees	Percentage
Required for Teachers and all Staff	50%
Plan to require for Teachers and all Staff	22%
Required for Teachers only	2%
Plan to add required training for Teachers	3%
Required for Administrators and Support Staff only	5%
Plan to add require training for Administrators & Support Staff	7%
Do not require training	30%

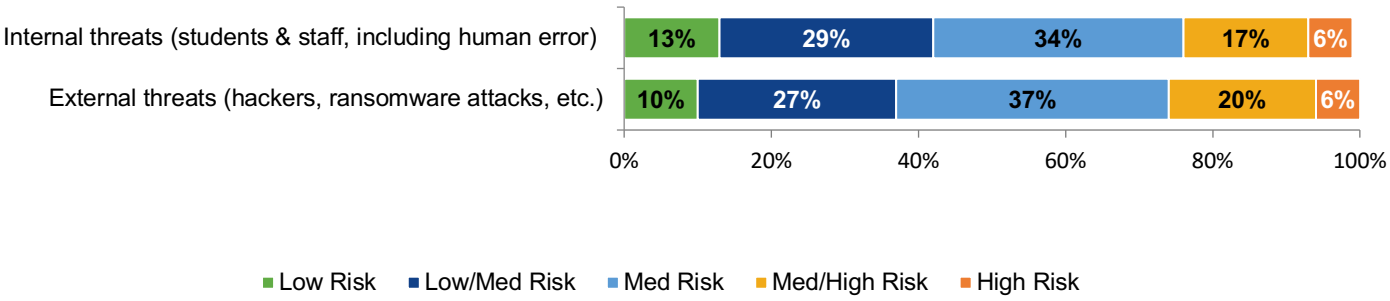
.

When asked about perceived risks to network security, respondents assessed internal and external threats about equally. Threats from outside hackers and ransomware attacks were assessed as low or low/medium risk by 37% of districts, compared to 42% rating threats from students and staff (including human error) as low or med/low risk. However, according to a recent report, external threat actors pose a much greater risk, comprising 80% of breaches in the education sector, compared to internal threats which comprise 20%.[12] Noted in the same report is the education sector's "unusually large percentage

[12] https://www.verizon.com/business/resources/reports/2021/2021-data-breach-investigations-report.pdf

of social engineering attacks."[13] Social engineering attacks are cybersecurity attacks that use impersonation to scam victims.

How Would You Rate Your Perceived Network Security Risk for The Following?

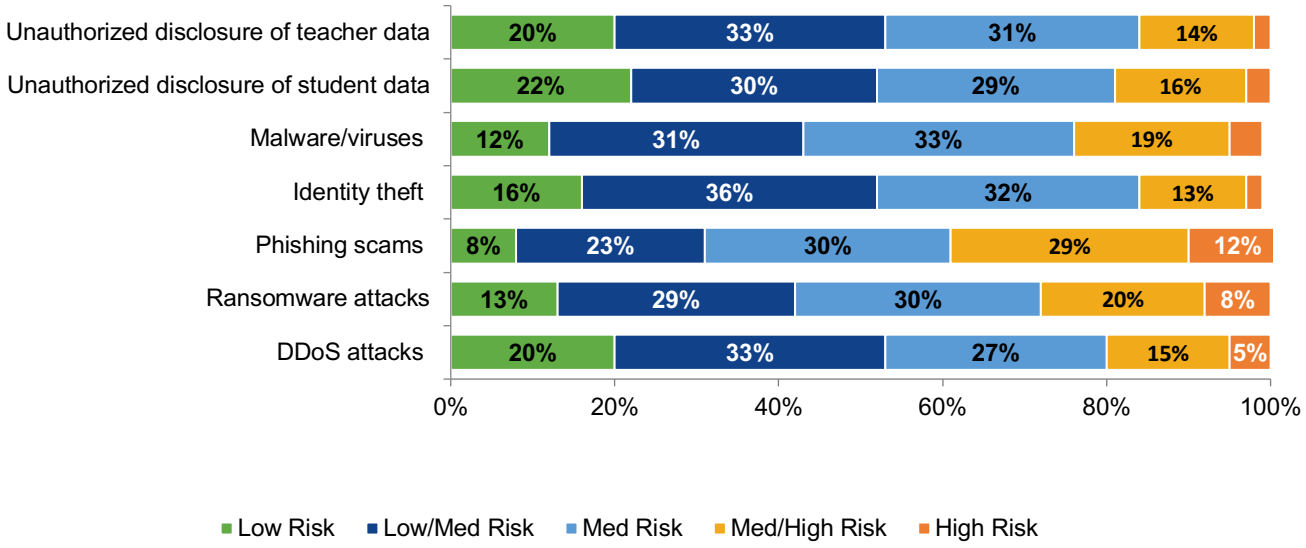


Respondents were asked to rate the perceived network security risks for various threat types. It was surprising that each of these risks were not perceived to be greater. The most common rating for any threat was either medium risk or low/medium risk. Of the seven threats on the survey, four were considered low or low/medium risk by most respondents. Phishing scams with 12% was the only threat perceived as high risk by more than 10% of respondents. Yet according to experts, that is the primary way that cyber thieves are accessing school networks. Less than one in ten (8%) of respondents feel they are at high risk for a ransomware attack. Unfortunately, this perception doesn't align with reality. In 2021, according to the Government Accountability Office, the majority of reported ransomware attack victims have been K-12 schools.[14]

[13] Ibid.

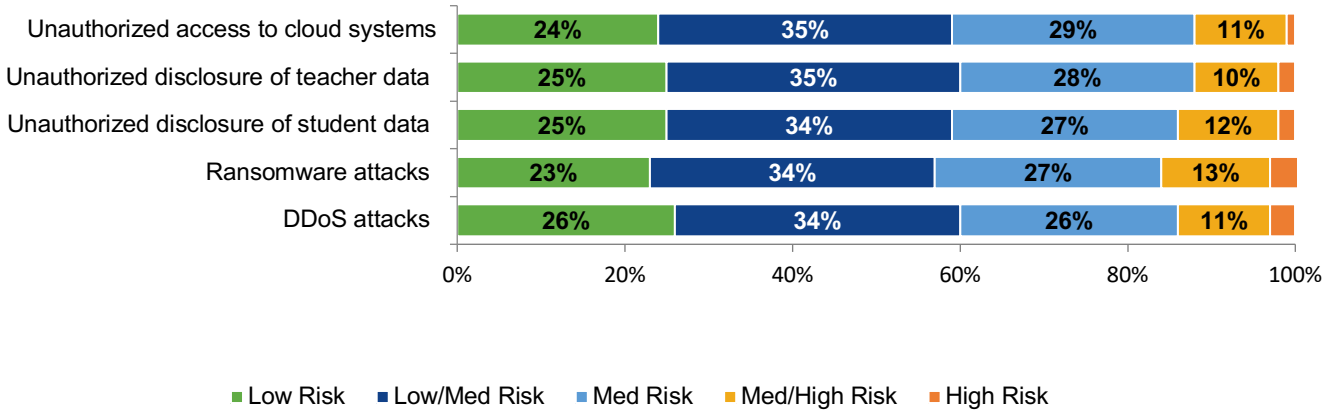
[14] https://www.gao.gov/assets/720/717522.txt

Perceived Network Security Risk for Threat Types



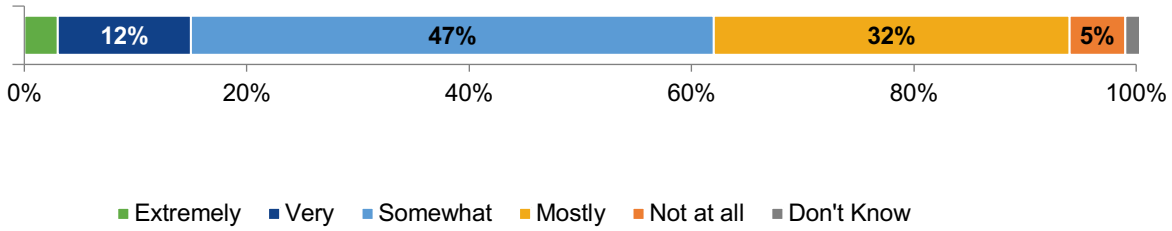
Another cybersecurity question was posed to respondents regarding perceived cybersecurity in the Cloud. Of the five threat types asked to assess, all five were considered low or low/medium risk by the majority. Less than 5% considered any threat high risk, with the greatest being ransomware with 4%. Unauthorized access to Cloud systems rated as the least likely scenario with only 1% rating it high risk. These results indicate that overall, IT Leaders are highly confident that their systems and data are secure in the Cloud. While Cloud service providers typically provide greater cybersecurity than locally hosted solutions, all Cloud solutions are not equally secure. It is important that districts closely evaluate the security practices of their SaaS and IaaS providers.

Perceived Cybersecurity Risk for Systems and Data Hosted in The Cloud



In assessing their own ability to address cybersecurity issues, 47% felt somewhat prepared, almost a third (32%) felt mostly prepared, and 12% felt very prepared. Only 3% felt extremely prepared. At the other end of the spectrum, 5% don't feel prepared at all, with 2% stating they just don't know.

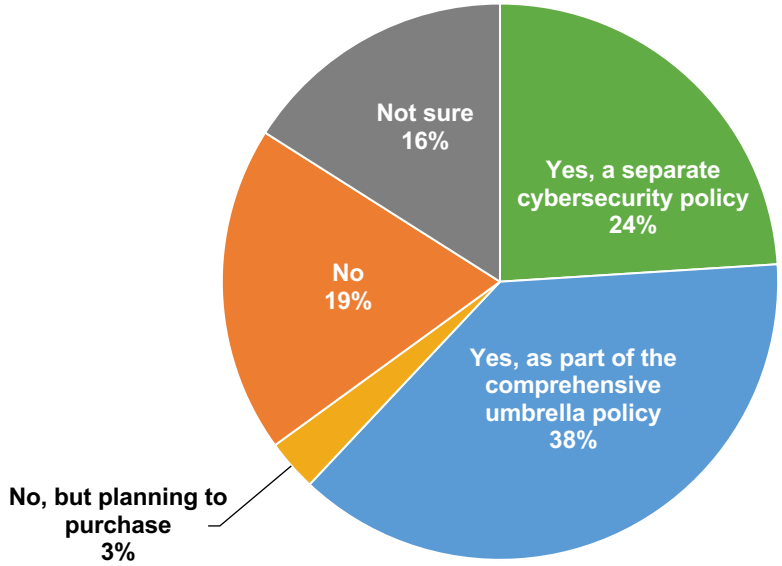
How Prepared Do You Feel to Address Cybersecurity Issues?



The majority (62%) of districts purchase cybersecurity insurance. Another 3% are planning to purchase. Having cyber insurance is a best practice as cybersecurity experts often advise it's a matter of "when, not if" an organization will experience an incident. Of those with insurance, 38% are covered as part of a comprehensive umbrella policy. Almost a quarter (24%) of districts purchase separate cybersecurity policies. As school systems have

become the major targets of attacks, insurers often have best practice prerequisites for purchase and payout such as requirements for multifactor authentication, cybersecurity training for staff members, and written cybersecurity governance policies with action steps. Insurers also don't want districts to publicize that they have coverage, as that can make them a more inviting target for a cyber-attacker. A curious 16% of respondents don't know if they have cybersecurity insurance. Perhaps this is because insurance for the district is managed by another department, such as finance. However, IT Leaders need to be part of the cybersecurity insurance discussion to ensure the district can comply with the requirements of the policy.

Does Your School System Purchase Cybersecurity Insurance?



Strategic Priorities

Since answer options changed from prior surveys, we can't do a direct year-over-year comparison regarding priorities. However, regardless of the list to choose from, cybersecurity has been the top technology priority for IT Leaders since 2018. This high priority ranking for cybersecurity, combined with a relatively high degree of self-assessed cyber preparedness, seems to suggest that it is by keeping cybersecuritya priority that districts stay prepared. Priorities involving

districts' networks were next in line, with network infrastructure in the number two slot and broadband and network capacity ranked third. The stress on networks to support the hybrid scenarios, the increased number of wireless access points, and the bandwidth demands of streaming and collaboration applications have required districts to prioritize network upgrades.

TABLE: Top Technology Priorities

Rank	Priority / Initiative
1	Cybersecurity
2	Network Infrastructure
3	Broadband & Network Capacity

Respondents were also asked to rank their top IT challenges. In this instance, year-over-year comparisons are possible. Budget constraints and lack of resources remain the number one challenge, as they have for every year since this survey began. Professional development issues move back into the number two position, where it was joined by the inability to hire skilled employees. These two challenges are one-two punches for districts—training for upskilling existing staff is not available nor are they able to hire staff that have the needed skills. Both these challenges are likely linked to the number one challenge of budgets. It is difficult to see how districts can address their priorities without first finding solutions to these challenges. The existence of silos in the district dropped off the top three list, most likely not because the silo issue has been solved, but because staffing issues have become greater concerns.

TABLE: Top Technology Challenges

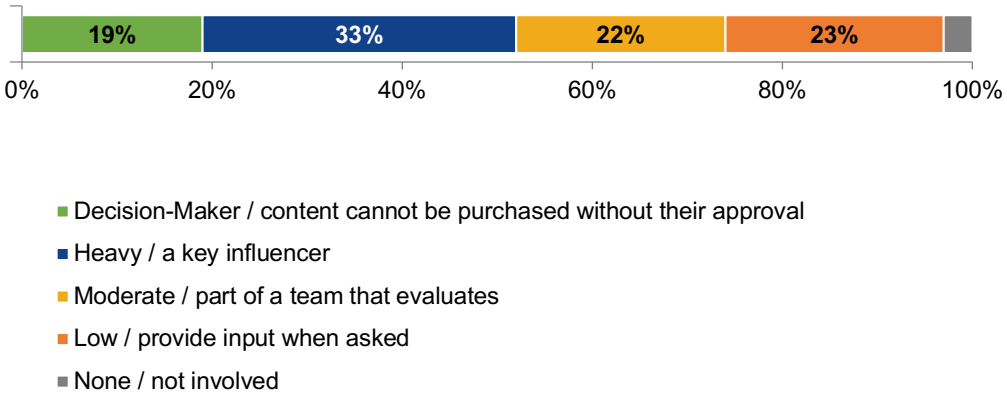
Rank	2020	2021	2022
1	Budget Constraints & Lack of Resources	Budget Constraints & Lack of Resources	Budget Constraints & Lack of Resources
2	Relevant Training & PD Unavailable	Existence of Silos in the district	Relevant Training & PD Unavailable
2*	Existence of Silos in the district	Relevant Training & PD Unavailable	Inability to hire skilled staff

* Tied with entry above

Procurement

IT Leaders are involved in selection of digital content. More than half (52%) have heavy involvement in the procurement of digital instructional materials, including 19% who serve as the final decision maker. Another 22% are part of the team that evaluates purchases. District IT Leadership play an essential role in determining how and *if* curriculum software and related assets can be integrated into the digital ecosystem. In adoption decisions issues such as interoperability and data security are as important as the efficacy of the instructional materials. District IT Leaders often have a more complete picture of what curriculum materials are being used throughout the school system. Their insights are important for long-term procurement planning and licensing renewals.

What Level of Involvement Does Your District's IT Leader Have When Making Decisions to Purchase Digital Instructional Materials?



A majority (53%) of districts have more than half their instructional materials in digital format. However, less than a quarter (21%) of districts have more than 75% digital. After more than two decades since states started to allow or require districts to adopt digital instructional materials in place of print, as well as two years of remote instruction, it is somewhat surprising that the penetration of digital materials is not greater. However, this may reflect districts' intention to maintain a hybrid approach to instructional materials. Print has its advantages—most significantly, it doesn't require connectivity for students to access. Though as more districts implement 1:1 programs, the

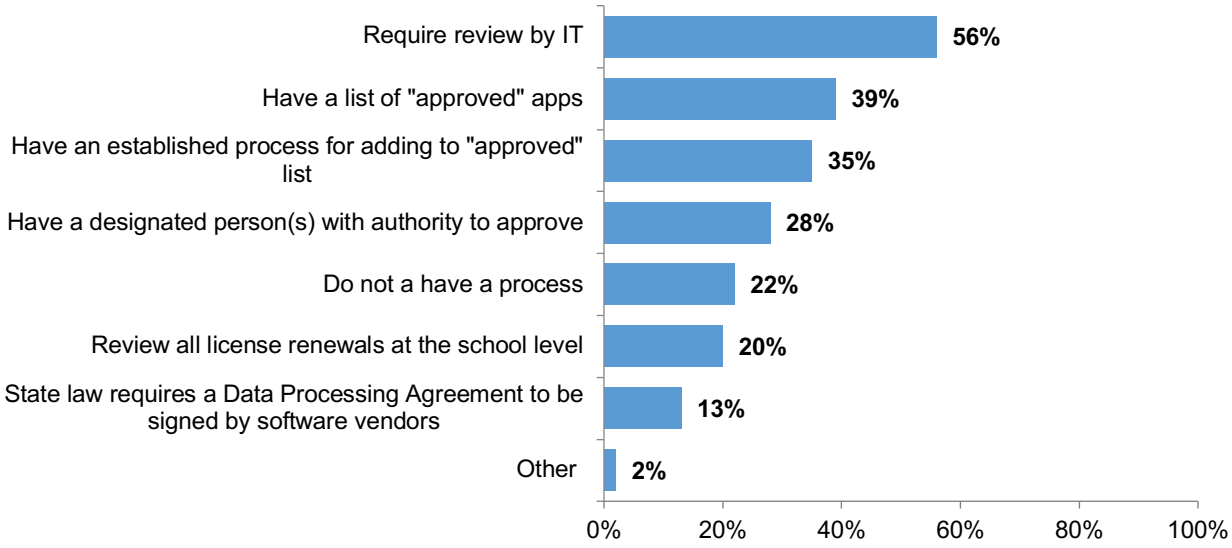
percentage of digital materials as compared to print may increase, especially if access to affordable home broadband also increases.

TABLE: Digital Instructional Materials

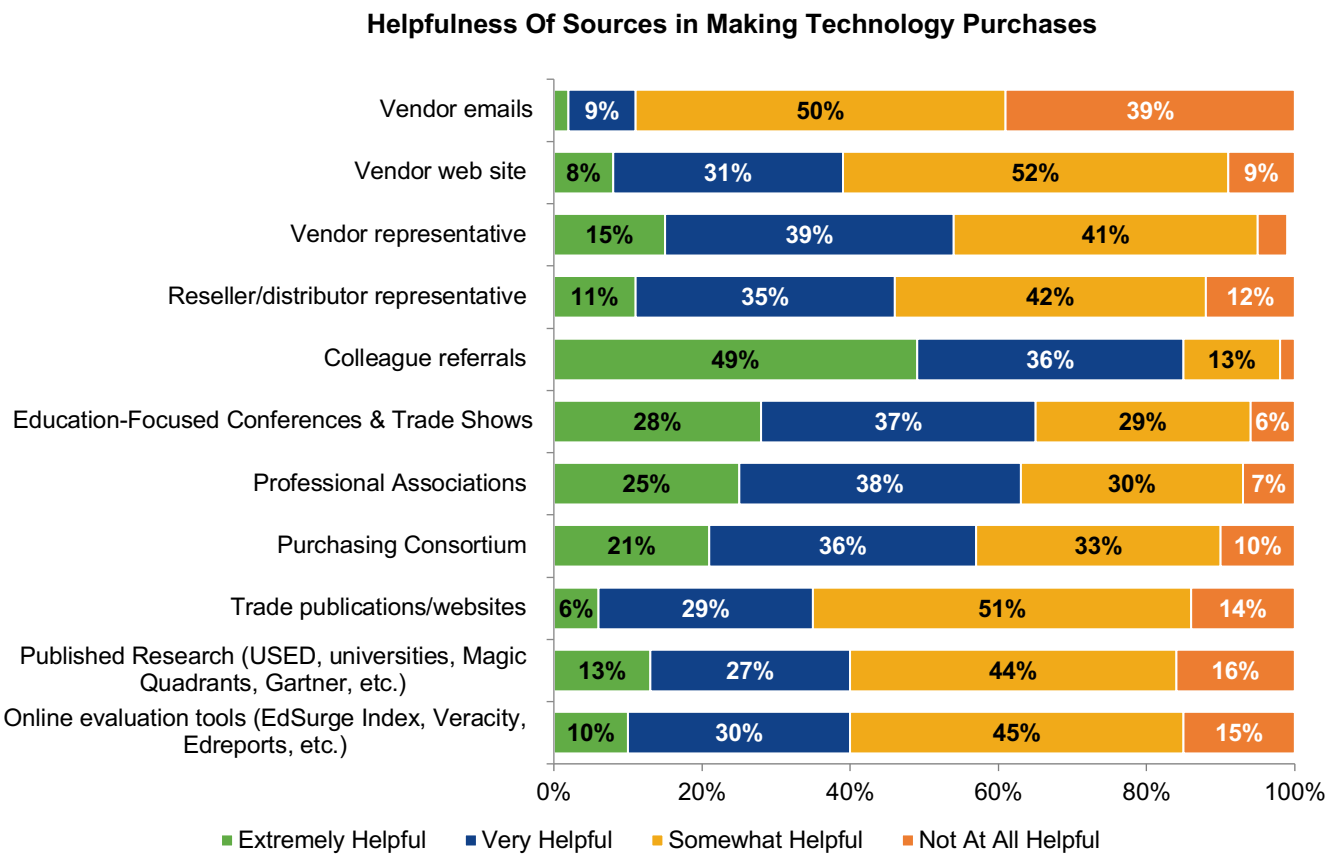
Percentage of instructional Materials in digital format	Percentage of districts
1-10%	2%
11-25%	8%
26-50%	37%
51-75%	32%
76-90%	17%
91-100%	4%

A large majority (78%) of districts have processes in place for reviewing and allowing the introduction of free tools into their digital ecosystems. A review by the IT department is required by 56%. A list of "approved" apps has been created by 39% and more than a third (35%) have an established process for adding to that list. Twenty-eight percent (28%) of districts have designated a person with the authority to approve free apps and 20% have processes at the school-level for license renewals. State laws requiring data processing agreements to be signed by software vendors—not something that is covered in the clickwrap agreements of free software—affect 16% of the respondents. Districts that have other processes not listed on the survey account for 2%. However, there are still 22% of districts that don't have any processes in place for reviewing free tools.

Process For Allowing the Use of Free Tools

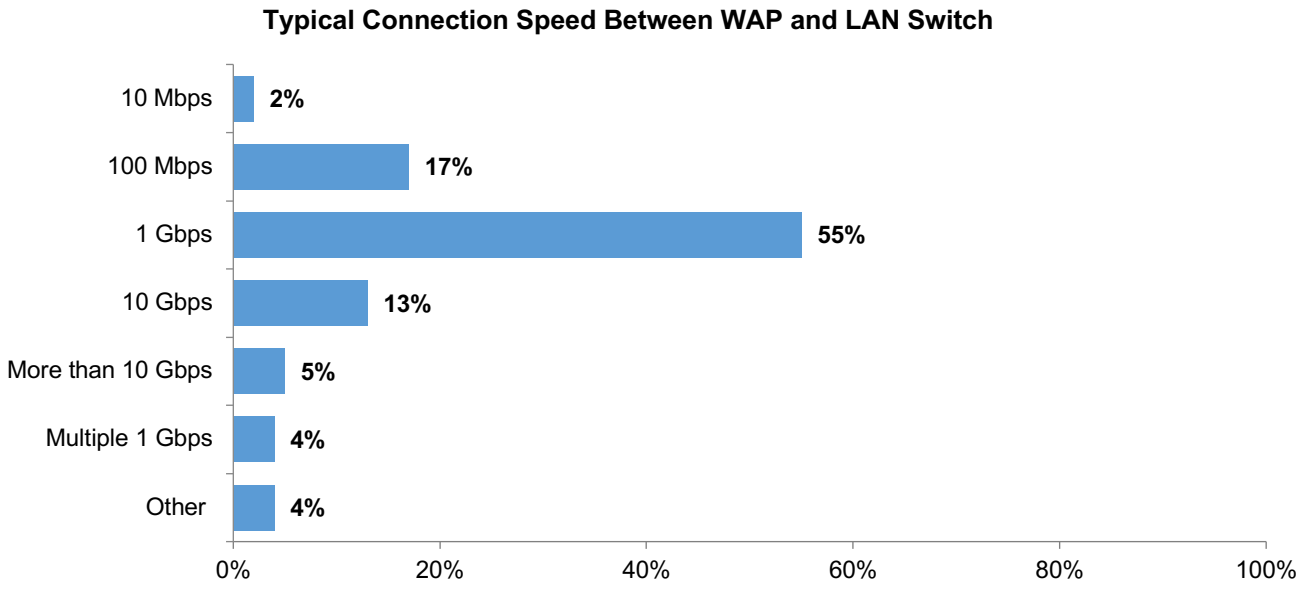


When making technology purchasing decisions, there are many places IT Leaders can look for information. Most look to their colleagues, with almost half (49%) finding colleague referrals extremely helpful and two-thirds (36%) finding them very helpful. Education-focused conferences and trade shows are considered the second most helpful source but with only 28% finding them extremely helpful and 37% very helpful. Professional associations are considered extremely helpful by a quarter (25%) of IT Leaders and very helpful by 37%. Purchasing consortiums are the next most popular resource with 21% rating them as extremely helpful and two-thirds (36%) as very helpful. More than a third (39%) of respondents rated vendor emails “not at all helpful,” making them the least helpful source of information for technology purchases. However, it is not clear if this low rating is due the content of the emails or the use of email as a medium to communicate the content.



Infrastructure

Overall, the school network is getting faster. The majority (55%) of districts have a 1 Gbps typical connection speed between the wireless access point (WAP) and the local area network (LAN). Four percent (4%) of districts have multiple 1 Gbps. Faster speeds are realized by 13% at 10 Gbps and 5% with more than 10 Gbps. Slower speeds of 100 Mbps were reported by 17% of districts with 2% reporting a speed of just 10 Mpbs.



Pandemic Initiatives

Since March of 2020, districts have been providing new services because of the pandemic. When asked about the services now being provided on an ongoing basis, COVID testing (56%) and contact tracing (53%) were the services most districts continue to provide. A plurality (42%) is still cleaning devices. More than a quarter of districts (29%) are providing remote counseling to address students' social and emotional learning, 28% offer telehealth options, and 27% conduct temperature testing. Of those districts providing ongoing services (13% don't provide any), it is concerning the service least provided directly impacts teachers, with only 12% providing them with remote counseling. Findings from a recent survey showed that compared to the rest of the population, teachers report "frequent job-related

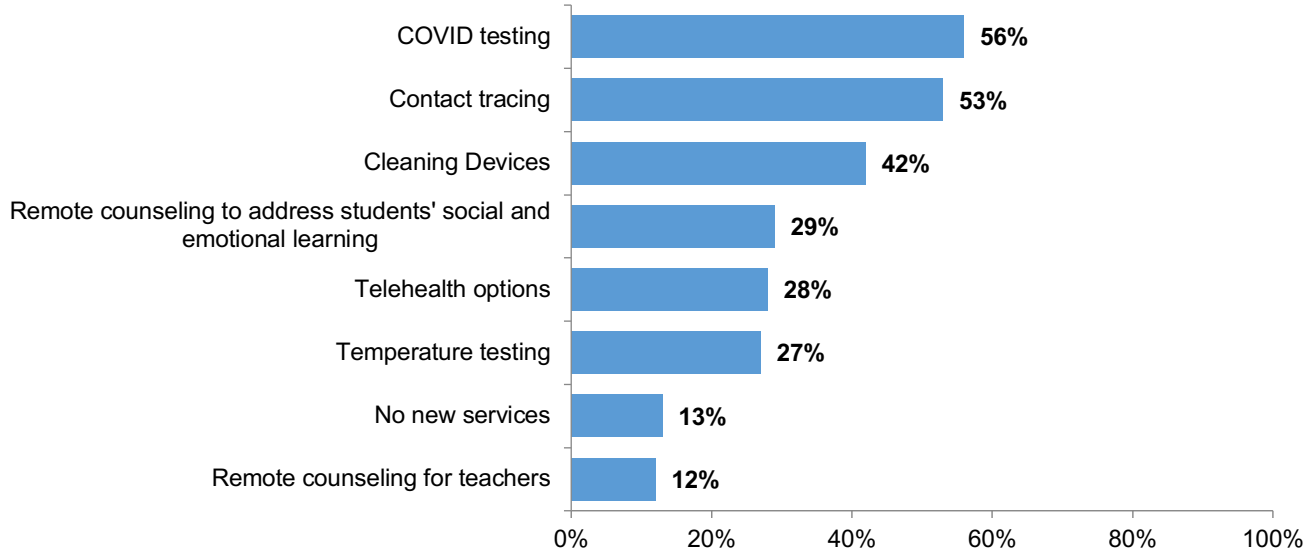
stress and symptoms of depression" at much higher percentages. The report also found these symptoms to be "nearly universal among teachers."[15]

In general, decisions to continue the use of these new practices are determined by the pandemic's ongoing impact on individual districts. Two separate comments from respondents highlight just how different the ongoing impact is—

> *"We are sun-setting many of the contact tracing and remote learning protocols. While these were an issue last year, they are not an issue in our current practice."*

> *"People are exhausted. The pandemic is not only not waning, but it is raging and ravaging my district. There is no end in sight."*

New Services Continuing to Be Provided Since the Pandemic



[15] Steiner, Elizabeth D. and Ashley Woo, Job-Related Stress Threatens the Teacher Supply: Key Findings from the 2021 State of the U.S. Teacher Survey. Santa Monica, CA: RAND Corporation, 2021. https://www.rand.org/pubs/research_reports/RRA1108-1.html.

The greater use of video conferencing during the pandemic increased the number of challenges confronting IT departments. However, these challenges appear to have abated overall. While the majority (58%) still experience bandwidth issues, this is an improvement over the prior year's 66%. Video conferencing security breaches reduced by more than half from 43% in 2021 to 20% this year, video conferencing privacy challenges reduced from 38% to 22%, and software installation issues from 21% to 11%. Fifteen percent (15%) of IT Leaders reported "no challenges" this year, more than double the prior year's 6%. Half (50%) of respondents cited training challenges. The issue of training was a new answer option added to this year's survey, which likely contributed to the significant reduction in year-over-year "other" challenges, from 22% to 6%. However, the large percentage of districts experiencing training challenges with video conferencing two years into remote teaching and learning likely reflects high teaching staff turnover and overall lack of training available for online learning.

Table: Challenges with Video Conferencing

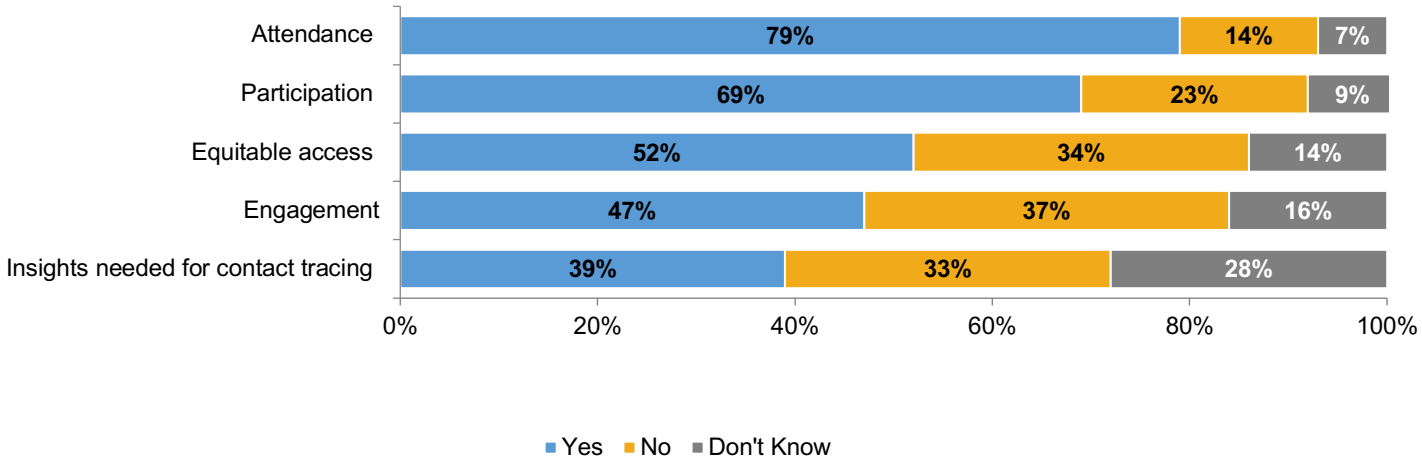
Challenge	2021	2022
Bandwidth	66%	58%
Security breaches (including Zoom bombing)	43%	20%
Privacy	38%	22%
Software installation	21%	11%
No Challenges	6%	15%
Training	*	50%
Other	22%	6%

* Not included on 2021 survey

Districts are best able to measure attendance, with 79% having systems in place to track it. Most (69%) measure student participation and more than half (52%) measure equitable access. Student engagement, a difficult aspect

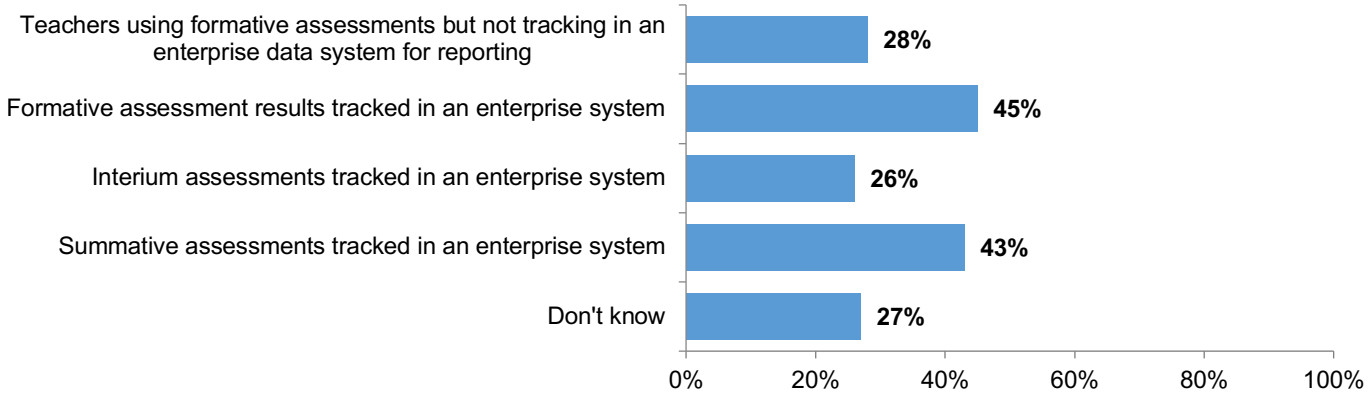
to gauge remotely, is measured by 47%. Systems delivering the insights needed for contract tracing are in place in more than a third (39%) of districts.

Adequate System Support for Measuring Remote Learning



Summative assessments and formative assessments are tracked in enterprise systems at roughly the same rates, 43% and 45% respectively. Formative assessments are also used by 28% of districts who don't record results for reporting purposes. More than a quarter (26%) of districts enter interim assessments into their enterprise system. IT Leaders who don't know how teachers track the various types of assessments account for 27% of respondents.

Assessment Data During Pandemic



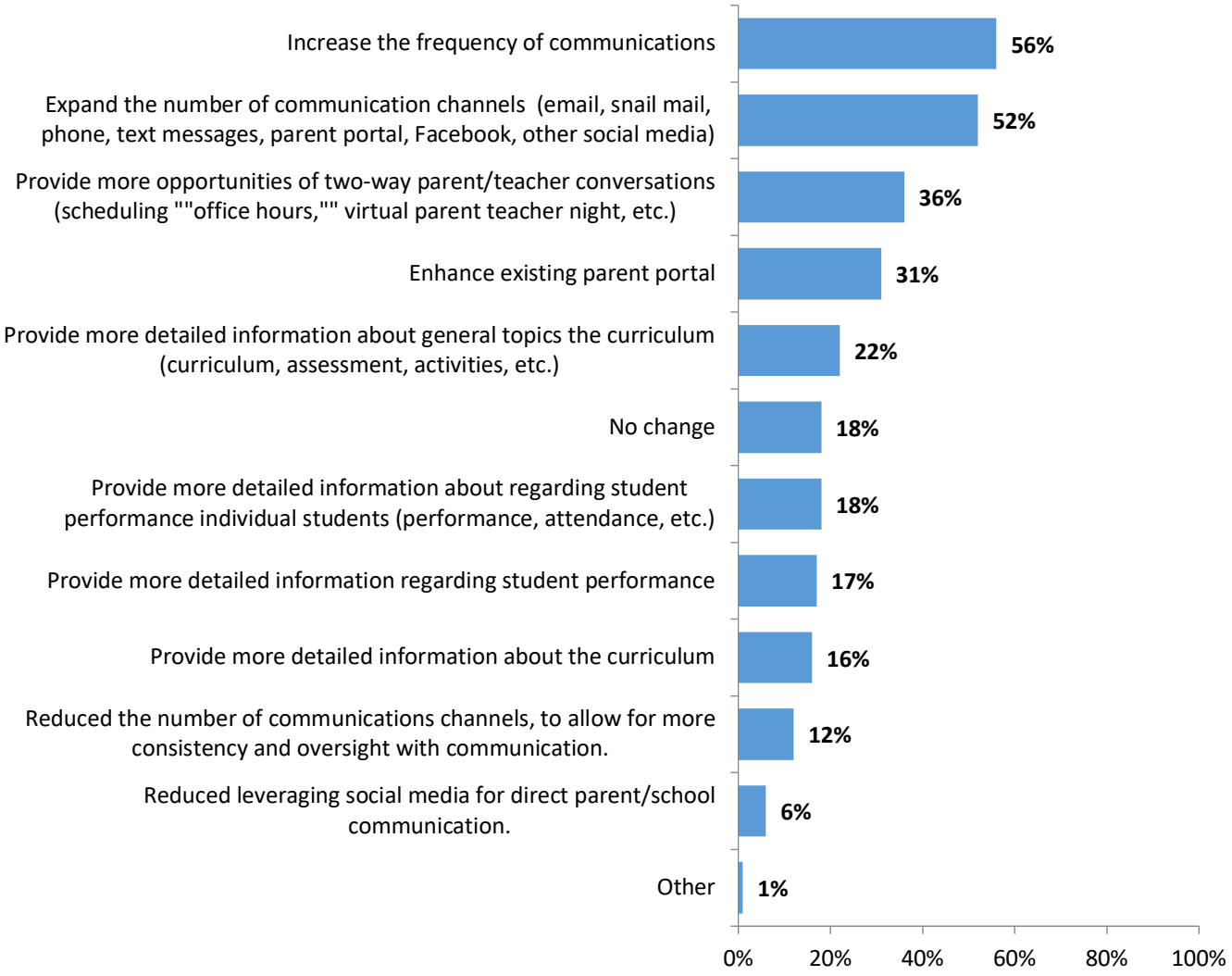
Research has shown that students benefit when their parents or guardians are involved in their learning. During the pandemic lockdowns, parents by default had greater exposure to what their children were doing in school. This is especially true for the youngest children, who needed the help of adults to set up devices and access software. As a result of the pandemic, the past two years have seen 82% of districts change their parental engagement practices. The majority of districts have increased the frequency of their communications to parents (56%) and expanded the number of communication channels used (52%). More than a third (36%) of districts are providing more opportunities for two-way communication. As one respondent explained—

> *Two-way communication with parents is more essential than ever before. Sending a newsletter isn't enough.*

One in three districts (31%) enhanced their existing parent portal, and 22% now provide more detailed information about the curriculum. Less popular changes were providing more detailed information regarding individual students (18%), providing more detailed information regarding student performance (17%), and providing more detailed information about the

curriculum (16%). However, there were some districts with practices that reduced communication—12% reduced the number of channels and 6% reduced their use of social media for parent/school communication.

How Has Your District Changed Parental Engagement Over the Past 2 Years?



Interoperability

"Data needs to be actionable to be useful. Integration is hard when silos mean lock-in."

2022 IT Leadership Survey Respondent

To enable schools' modernized infrastructure to work effectively, efficiently, and securely for teaching and learning, data interoperability is essential. In 80% of districts, IT Leaders report they are taking steps for interoperability improvement. Some districts are just beginning this work, with 15% of IT Leaders seeking help in knowing where to start on developing/implementing a district-wide plan. Many have already embarked on improvement methods. Educating stakeholders is the most common method employed, with 42% educating IT staff, 40% educating administrators, and 39% educating instructional leaders. Conveying interoperability requirements to vendors is a best practice strategy and 9% of districts are seeking help on how to do that effectively. Twenty-eight percent (28%) of districts convey interoperability requirements to vendors and 15%, perhaps while conveying those requirements, are educating their vendors on interoperability. More than a quarter (26%) are modifying their procurement processes to ensure there is IT involvement. As one respondent warned—

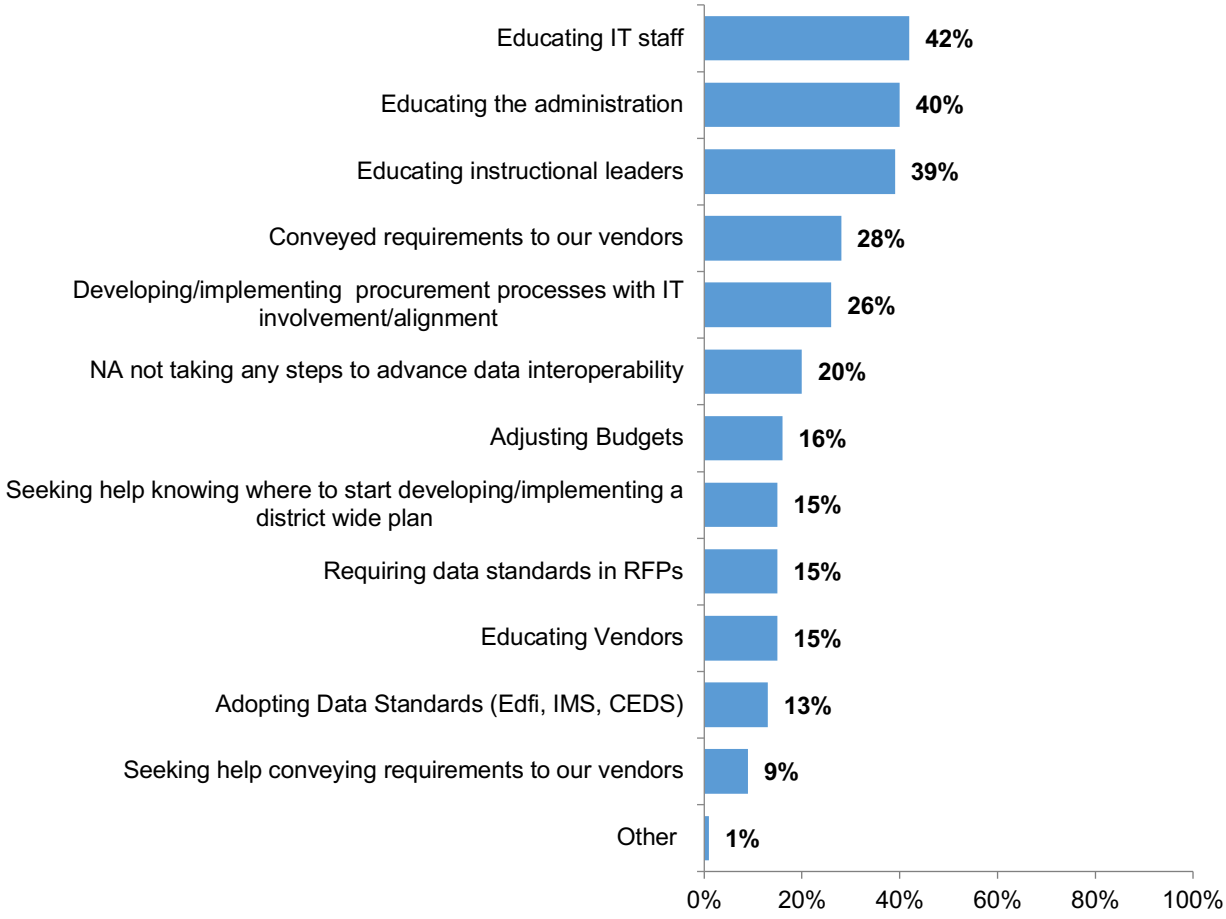
"Decisions made without technology involvement leads to data inconsistency and security issues."

Adopting common industry data standards and requiring providers to adhere to those standards is one of the surest ways to ensure systems within a district are interoperable. In the words of one respondent—

Standards in technology adoption support a cost-effective and consistent experience in teaching and learning for all teachers and students.

Data standards are being adopted by 13% of districts with 15% including data standards in their RFPs. Budget adjustments regarding interoperability are being made in 16% of districts.

What Steps Are Your District Taking to Advance Data Interoperability?



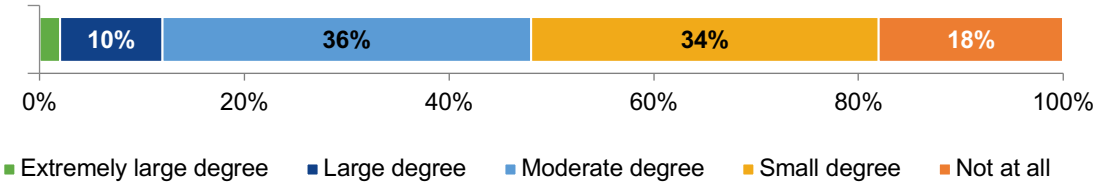
Single sign-on (SSO) is the most-implemented interoperability initiative with 80% of districts having fully or partially implemented it, including a third (33%) that have fully implemented it. While a majority of districts have implemented data and content interoperability initiatives to some extent, 56% and 54% respectively, less than one in ten (8%) have fully implemented either one. Half of districts (50%) have partially or fully implemented analytics tools, with the fully implemented rate at 8%.

TABLE: Implementation of Interoperability Initiatives

Interoperability Initiative	Fully Implemented	Partially Implemented	Planning	Not at All	Don't Know
Single Sign-On	**33%**	**47%**	**7%**	**8%**	**5%**
Data interoperability	**8%**	**48%**	**16%**	**15%**	**13%**
Analytics & Data Visualization Tools	**8%**	**42%**	**20%**	**18%**	**12%**
Content Interoperability	**8%**	**46%**	**14%**	**17%**	**14%**

Lack of interoperability affects operational efficiency for 82% of districts. Manual data entry, extract, transform, load procedures (ETL), data flat file exports/imports, FTP and other data sending/transferring methods are all non-value-add activities. These work-arounds affect 48% of districts to at least a moderate degree, including the 12% who were affected to a large or extremely large degree. About a third (34%) are impacted to a small degree.

To What Degree Do Work Arounds for the Lack of Data interoperability Impact the Operational Efficiency of Your District?



The ability to seamlessly move data between systems is optimal for any digital ecosystem. As one respondent shared—

> *"Interoperability is crucial for us. We have a small technology team and the more seamless data transfers from one point to another is huge."*

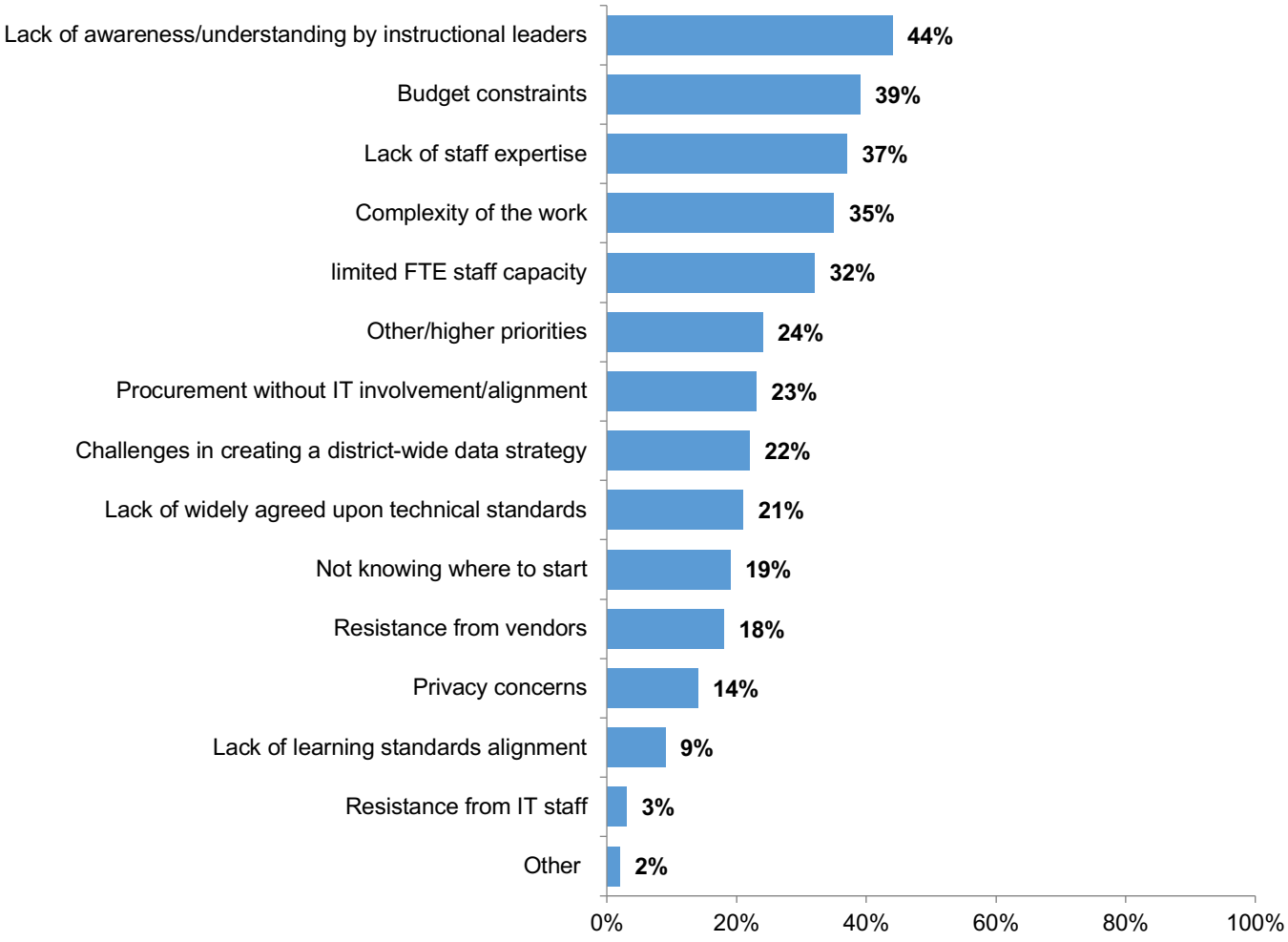
However, there are many factors that can serve as obstacles to districts seeking to increase data interoperability. Lack of awareness/understanding of the issue by instructional leaders was the most common barrier cited by

respondents, with 44%. This was followed by budget constraints with 39% and lack of staff expertise with 37%. The complexity of the work, likely linked to required staff expertise, was cited by more than a third (35%). Workload was the key factor in next most common barriers—limited FTE staff capacity (32%) and other/higher priorities (24%). Lack of involvement of IT during procurement impacted 23% of districts. One respondent provided some general advice that especially applies to improving data interoperability—

"Involve IT and everything goes better."

Challenges in creating a district-wide data strategy was named as a hurdle by 22% of respondents and the industry's lack of widely agreed upon technical standards by 21%. The following barriers were cited by less than 20% of respondents—not knowing where to start (19%), resistance from vendors (18%), privacy concerns (14%), lack of learning standards alignment (9%), resistance from IT staff (3%), and other factors not listed on the survey (2%).

What Are the Barriers to Improving Data Interoperability in Your District?



Summary

The initial pivot to remote learning in 2020 highlighted both the strengths and weaknesses of the modernization efforts in school systems. In 2022, districts were able to address some of their weaknesses regarding 1:1 deployment, purchasing practices for new devices, SSO, video conferencing implementation, and processes for managing free apps. The pandemic served to accelerate many positive IT initiatives but as expressed by one respondent—

> *"Using technology as a catalyst for pedagogical change cannot happen in the midst of a pandemic."*

Increased demands on IT, limited resources, lack of professional development, and the inability to hire skilled staff hampered modernization efforts. As explained in one respondent's comment—

> *"It's hard to build internal tech capacity when you're managing through a pandemic."*

Nevertheless, they persevered. And one respondent's comment is reflective of many of the sentiments expressed by K-12 IT Leaders in the open-ended portion of the survey and serves to sum up this past year—

> *"Covid has made things difficult but not impossible."*

About the Survey

Results from this year's survey were compiled from over 1,500 surveys. With the help of our partners MCH and K12 Insight, the 47-question survey was mailed to school district information technology leadership and data collected January 11 through February 28, 2022. Findings for each item in the report exclude participants who did not answer. In graphs, data labels less than five percent are not shown. Percentages may not total 100 due to rounding.

CoSN is the premier professional association for school system technology leaders and educational leaders to leverage technology to realize engaging learning environments. Visit cosn.org or email membership@cosn.org to find out more about CoSN's focus areas, annual conference and events, advocacy and policy, membership, and the CETL™ certification exam.

As a trusted partner to school districts of every size, CDW·G has more than 300 dedicated K-12 account managers, education strategists and learning environment advisers focused on connecting education technology to student achievement. Our team's experienced educators, technology directors and superintendents understand what it's like to stand in your shoes–and are uniquely qualified to partner with you to design, implement and manage your EdTech initiatives.

The Ed-Fi Alliance is a nationwide community of leading educators, technologists, and data advocates connecting student data systems in order to transform education. A not-for-profit organization founded in 2012 by the Michael & Susan Dell Foundation, Ed-Fi aims to boost student achievement by empowering educators with real-time, comprehensive insight into every student. Ed-Fi technologies streamline data management in school districts and states across the country. By allowing schools to integrate data previously siloed within disconnected tools and software—and organizing it through a single, secure data standard—Ed-Fi solves one of the country's most perplexing educational challenges: how to get a complete, accurate view of individual student achievement, so that every student can receive the support they need when they need it most.

AASA, The School Superintendents Association, founded in 1865, is the professional organization for more than 13,000 educational leaders in the United States and throughout the world. AASA advocates for equitable access for all students to the highest quality public education and supports school system leaders.

K12 *Insight* partners with school districts to provide better experiences, engagement, and education using a powerful customer experience platform and chatbot, research, and professional development. As a leading innovator of customer intelligence solutions for schools, we've helped over 400 districts across the nation adapt to the digital transformation. We help districts deliver superior customer experiences — which builds trust, promotes family and community engagement, and fosters a positive school environment. K12 *Insight* offers the only all-in-one, enterprise-wide customer experience and intelligence platform designed for K-12 — helping districts streamline inbound communications, identify problems before they become crises, and build trust capital.

MCH Strategic Data is a pioneer and innovator in educational marketing data. For nearly a century MCH has helped businesses reach administrators and educators within school districts nationwide and of all sizes. Trusted by the CDC, National Institutes of Health and Harvard to provide the most up-to-date school district data during the pandemic, they offer national data coverage, invaluable expert insights and top-tier personal service to help clients reach their customers with pinpoint accuracy.

About Survey Report Author:
Paula Maylahn is an education consultant with 38 years' experience across K-20. She is project director for CoSN's interoperability initiatives and contributing author on, "The Experts' Guide to the K-12 Market" and "The Experts' Guide to the Postsecondary Market", as well as author of, "Interoperability: Definitions, Expectations, and Implications." Paula is a council member of the Women's Education Project, executive advisory council member of the Software & Information Industry Association, former executive council member of the PreK-12 Learning Group of the Association of American Publishers, and former board member of the United Design Guild where she chaired the education council.