Best Practices from CoSN's Peer Review Program

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CoSN
LEADING EDUCATION INNOVATION

Executive Summary

The CoSN Peer Review program was developed in direct response to district leaders' requests for help in applying best practices that will measurably advance their technology goals strategically, systematically and successfully. The program involves a Peer Review team made up of seasoned practitioners from school districts around the country. Having now conducted 16 different reviews, CoSN wanted to compile the best practices from the reviews so that all districts can learn from them. The results are organized in the same way as the Digital Leap Success Matrix – a matrix developed by K12 edtech school/system leaders that outlines what success means in school district/system technology today.

Leadership and Vision

1. Be open to failure and self evaluation.
2. Have a shared vision between the technology and instruction team including regular collaboration and communication.
3. Ensure technology staff are included at the highest decision making level.

Strategic Planning

1. Ensure strategic planning involves all stakeholder input in the planning process.
2. Develop a technology specific vision and plan for implementation.

Ethics & Policies

1. Develop policies and plans that are key to making progress in any area. The policies needing the most changes were digital equity, digital citizenship and cybersecurity.
2. Ensure K12 edtech technology teams have a systematic way of approving applications and controlling administrative rights.

Instructional Focus & Professional Development

1. In an accelerated 1:1 environment, professional development is needed now more than ever for all levels and types of staff.
2. Provide professional development to educators so that they can be involved with leading new technology initiatives.

Team Building & Staffing

1. Invest in professional development for technology staff and creating career paths in the technology department is important for morale and productivity.
2. Gain a better understanding of how districts/systems comparison can be used. As an example districts compared to peers may have identified a need for additional staff, but that it is not always apparent from within the technology team.

Stakeholder Focus

1. Build stronger relationships and trust with stakeholders particularly around technology planning and implementation.
2. Participate in a Peer Review process to ensure all stakeholder voices are heard.

Infrastructure

1. Use consistent update and replacement cycles.
2. Create accountability structures around ticket management and resolution.
3. Develop both proactive and reactive strategies, processes, and documents to address cybersecurity threats.

Information and Data Management

1. Create interoperable systems whenever possible.
2. Enhance training and professional development around student data privacy for educators and administrators.

Communications Management

1. Provide clear communication to parents around daily operations, strategic direction and technological support.
2. Ensure website and communications with parents are ADA compliant and available in different languages.

Business Management

1. Districts need to have multiple places in the cloud and on premises where they backup data.
2. Purchase a cyber insurance policy.
3. Create three – five year roadmap for technology planning including purchasing and refresh cycles.

About CoSN

CoSN (Consortium for School Networking) is the premier professional association for K12 school system technology leaders. CoSN provides thought leadership resources, community best practices and advocacy tools to help leaders succeed in the digital transformation. Today, CoSN represents over 13 million students in U.S. school systems/districts and continues to grow as a powerful and influential voice in K12 education.

Blaschke Fellowship Fund

The Blaschke Fund was created in 2019 to support emerging leaders in education technology policy and advocacy. The memorial fund honors the late edtech leader Charles Blaschke, who conducted pioneering research and analysis on the ever-changing U.S. education landscape for over 50 years. The Blaschke fellowship is designed to give graduate students in public policy and/or education an opportunity to work with CoSN on education policy projects. Priority is given to initiatives focused on national education technology issues, such as funding, legislation and/or policies. Policies could include ensuring digital equity, protecting privacy of education data, enabling accessibility or other key topics.

Background

Peer Review Program

CoSN's Peer Review program was developed in direct response to district leaders' requests for help in applying best practices that will measurably advance their technology goals strategically, systematically and successfully. The program involves a Peer Review team made up of seasoned practitioners from school districts around the country. Using the Digital Leap Matrix as their guide, the reviewers select appropriate peer school districts for comparison and conduct three days of fieldwork. The field work consists of interviews, document review, surveys, classroom observations, focus groups and onsite inspection. All interviews are conducted anonymously to keep the focus of the analysis on the processes and not specific people. After the field work is completed, the Peer Review team delivers a final report to the District leadership for implementation.

Digital Leap Success Matrix

The K12 Digital Leap Success Matrix was developed by a group of national technology leaders under the direction of CoSN. The Matrix outlines the practices needed to be a successful

digital school system in the 21st century. It is the frame of analysis for the Peer Review Team and directs commendations and recommendations. The matrix contains ten specific skill areas:

1. Leadership and Vision
2. Strategic Planning
3. Ethics & Policies
4. Instructional Focus & Professional Development
5. Team Building & Staffing
6. Stakeholder Focus
7. Infrastructure
8. Information and Data Management
9. Communications Management
10. Business Management

Methodology

Since 2016, CoSN has conducted 16 Peer Reviews for school districts around the country. The purpose of this research is to discover commonalities among school districts as well as distinctions through the analysis of the Peer Reviews. Descriptive statistics about the schools and school districts that participated in Peer Reviews were collected to provide context for the key findings and point to potential limitations. The descriptive statistics were gathered from the National Center for Education Statistics, State Department of Educations' school district report cards and school system/district websites. The Aggregated survey results are from CoSN's Digital Leap Success Assessment, the districts that participated in the survey primarily (98%) public school districts. The best practices identified in the report were supported by CoSNs IT Leadership Survey and the Digital Leap Success Matrix.

Descriptive Statistics on the Peer Review Districts

The data sample used for this research comes from the Peer Reviews conducted by CoSN. The sample is overrepresented by midwestern school districts, which make up a little over half of the Peer Reviews, followed by the south/southwest, which have three districts, and the northeast with three districts. The least represented region is the west, with only one district from the pacific. The schools and school districts varied greatly in size from the **smallest being a high school with 1,092 students to a school district of 27,963 students. The majority were under 9,000 students.** The median household income of the sample was $87,851, which is $19,148 above the national median (Source). Most schools and school

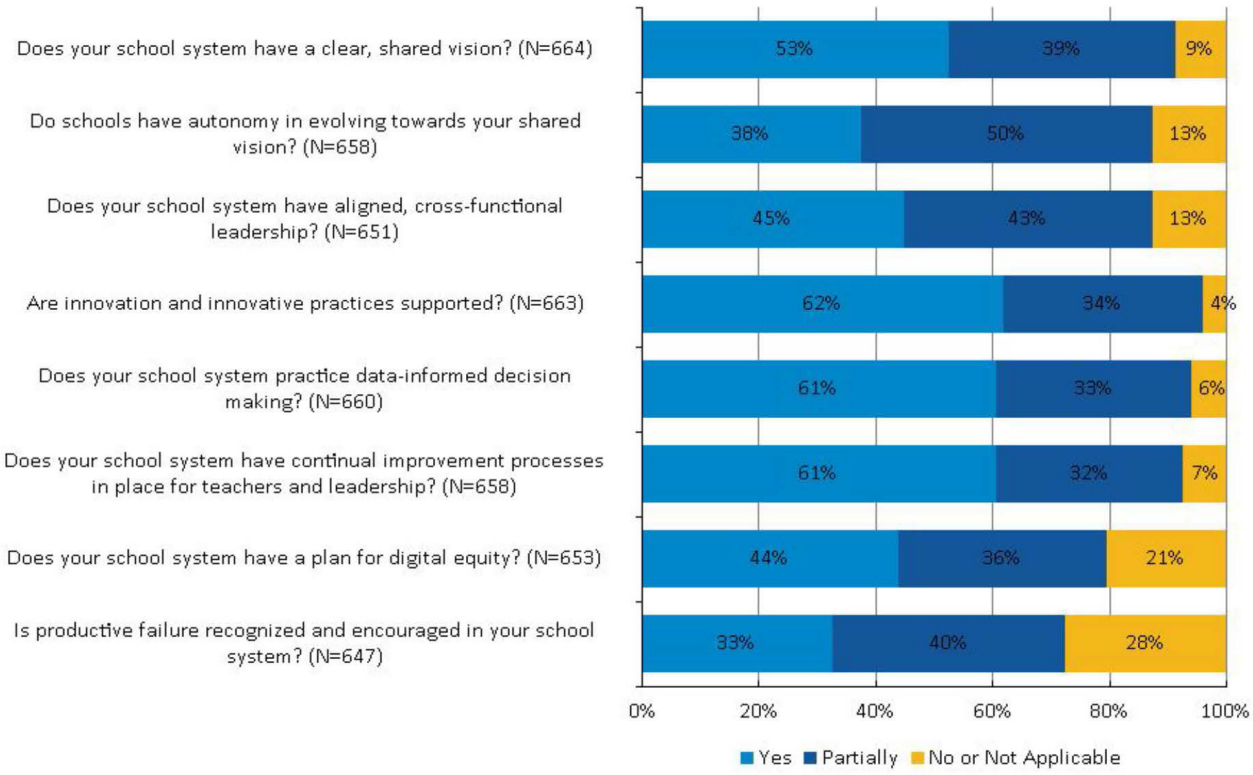
districts were located in large suburbs (nine) or small cities (five). A smaller amount were in rural areas (one) or towns (one).

Key Findings

The findings of best practices are organized in the same way as the digital leap success matrix. This is the same framework used in Peer Reviews and highlights all of the critical areas for districts in educational technology. Each section is a different skill area and begins with survey results from CoSN's Digital Leap Success Assessment. Following that are the best practices demonstrated through quotes, school district examples, CoSN best practices and other research. The paper will close with final recommendations and thoughts about the future of school districts and technology.

The average district is located in a large suburb in the midwest, has a median income of $87,851, around 5,000 students of which 40% of them receive free or reduced lunch.

Leadership and Vision



Best Practice: The executive team works together to develop a shared vision with all stakeholders for effective and strategic technology use. Technology staff are included at the highest decision making level ie. the superintendent's cabinet. The Technology and Instruction Staff meet and collaborate regularly on implementation of their technology vision. Staff are encouraged to take risks and feel supported in their failures to encourage innovation.

Self-Evaluation and Failure

The districts that were the best in leadership and vision were those that had technology teams who were open to honest self-examination and regularly scheduled assessment of department processes. It was also important that district leaders supported innovation and risk taking by encouraging teaching innovation. The practices that were associated with this commendation were districts that encouraged productive failure and were understood by all stakeholders as an enabler for innovation. K12 edtech leaders also should have an understanding that assessments and continuous improvement carry a certain degree of risk. District staff were willing to take risks to improve their capabilities. Most Peer Review districts scored high on this by the sheer action of participating in a Peer Review process.

Bringing Technology and Instruction Staff Together

While the districts all did considerably well on encouraging self examination and okay on innovation, most struggled with siloed instructional and technology teams. Part of district leadership and vision is ensuring that instruction and technology staff are making decisions together. Depending on each district's specific organizational structure the recommendation may vary, but generally, reviewers recommended establishing a formal leader for the coaching staff who effectively combines instruction and a full understanding of technology. That way they are representing both departments. Additionally, it was recommended that districts unify the technology and instructional teams with regular meetings which will allow them to build a common understanding around the technology vision.

Another key component to integrating the two teams is including both in project management and implementation of new technologies. Some school districts tended to exclude technology departments until the conclusion of a project. In one district, Technology Integrations Specialists were not part of the software decision-making process, but they were expected to support the software as it is introduced to teachers and integrated into the ecosystem. Procedures should identify collaborating stakeholders based on projected impacts

on their roles for each project in advance of a launch to ensure consistency. A best practice identified in the Digital Success Matrix is that the **technology department should lead district technology initiatives, collaborating across departments and functional areas in support of the adoption and implementation of technology in all aspects of school business.** Including those that improve teaching and learning and promote skills needed to be successful at future jobs (which may not even be known right now).

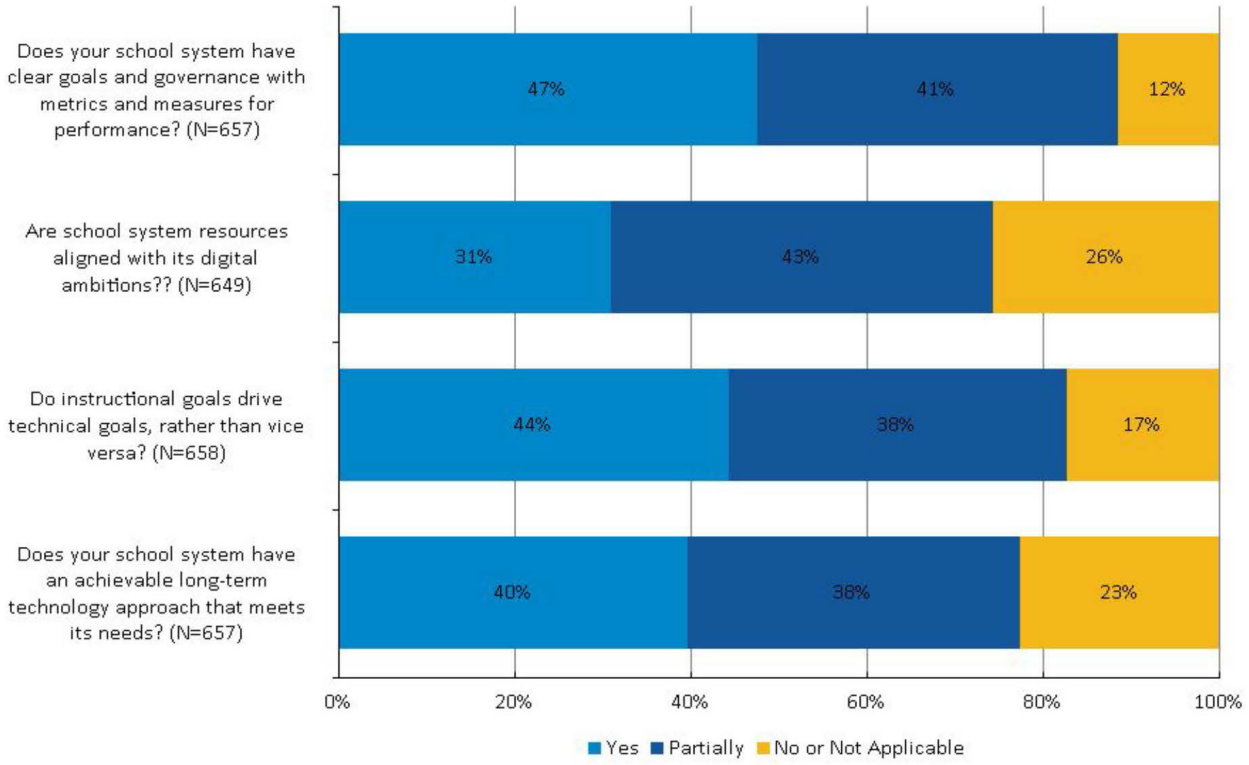
Technology Leader Representation

Inclusion of technology staff should also be supported at the highest decision making level. According to the IT Leadership Report Survey 2021 57% of IT leaders reported directly to the superintendent. Being part of the Superintendent's cabinet enables IT Leaders to participate in planning how technology can be leveraged to support district goals. The remaining districts in which the IT Leader does not report to the superintendent may say more about the difficulties in changing established reporting structures, rather than the benefits of such a reporting arrangement. **At a minimum, districts need to have a system in place to include their IT Leaders as part of cabinet-level conversations around priorities and expenditures. It is with collective decision-making that a comprehensive funding model can be created to directly support the technology plan.**

Developing a Shared Vision

The best school systems/districts had a shared vision for creating and sustaining a digital environment that is aligned with the school system's strategic plan and goals. As part of developing a shared vision, it is best practice to include a variety of stakeholder input (administrators, teachers, students, parents, community members, etc.). Then have stakeholders articulate how it connects to their own work. Some districts were so dedicated to the shared vision that they shared it on the school district website.

Strategic Planning



Best Practice: School system leaders utilize their high-level view of the school system to identify the steps needed to transform the digital vision into a long-range plan, complete with specific goals, governance, objectives, and action plans. Stakeholders know what the strategic plan is and specifically how it relates to technology. They are also included in the creation of the strategic plan.

"In the absence of a strategic plan what am I aligning to?"

A common issue under strategic planning is the exclusion of technology departments. A similar perception emerged across multiple reviews, which is that technology is in some cases adopted for its own sake rather than as a part of curricular need. This indicates that there is a lack of strategic planning and technology vision.

The majority of Peer Review districts did not have a strategic plan that leveraged technology to meet or exceed districts' K12 learning goals within a five-year phased roadmap which is best practice. The five-year road map should also include Key Performance Indicators (KPIs) appropriate to each phase of the deveployment. Some of the common causes of this are that technology staff are highly focused on infrastructure, leaving little time for planning and other duties. The existing technology plan concludes at the end of each school year or there just simply isn't enough buy-in. High staff turnover particularly at the superintendent level can prevent districts from developing a long-term vision and strategy.

Developing a Strategic Plan

Developing a long-term plan and being able to articulate it and share it with stakeholders is critical. When the whole district staff is aware of the direction that they are going, it provides buy-in and sets the course for change. Also part of having an impactful strategic plan is eliciting input from a wide range of stakeholders in the development of the plan. There also must be a concentrated effort to build a culture of planning within the technology department.

"When we have parents as partners it helps us set the course and helps us to support our programs."

When developing a strategic plan engaging a range of stakeholders is best practice. For example, technology staff, parents, teachers, students, and union leaders are key stakeholders. One school district had a teaching, learning and technology committee (TLT) that met regularly and collaborated to come up with their Technology and Strategic Plan. The TLT committee is a best practice for school districts that need more collaboration across departments. It includes stakeholders from different parts of the district operation.

A great technology plan considers the sustainability of current practice with defined replacement cycles and policies in place for upgrades and improvements. In a handful of schools upgrades and improvements were made as needed instead of having a clear sustainability plan.

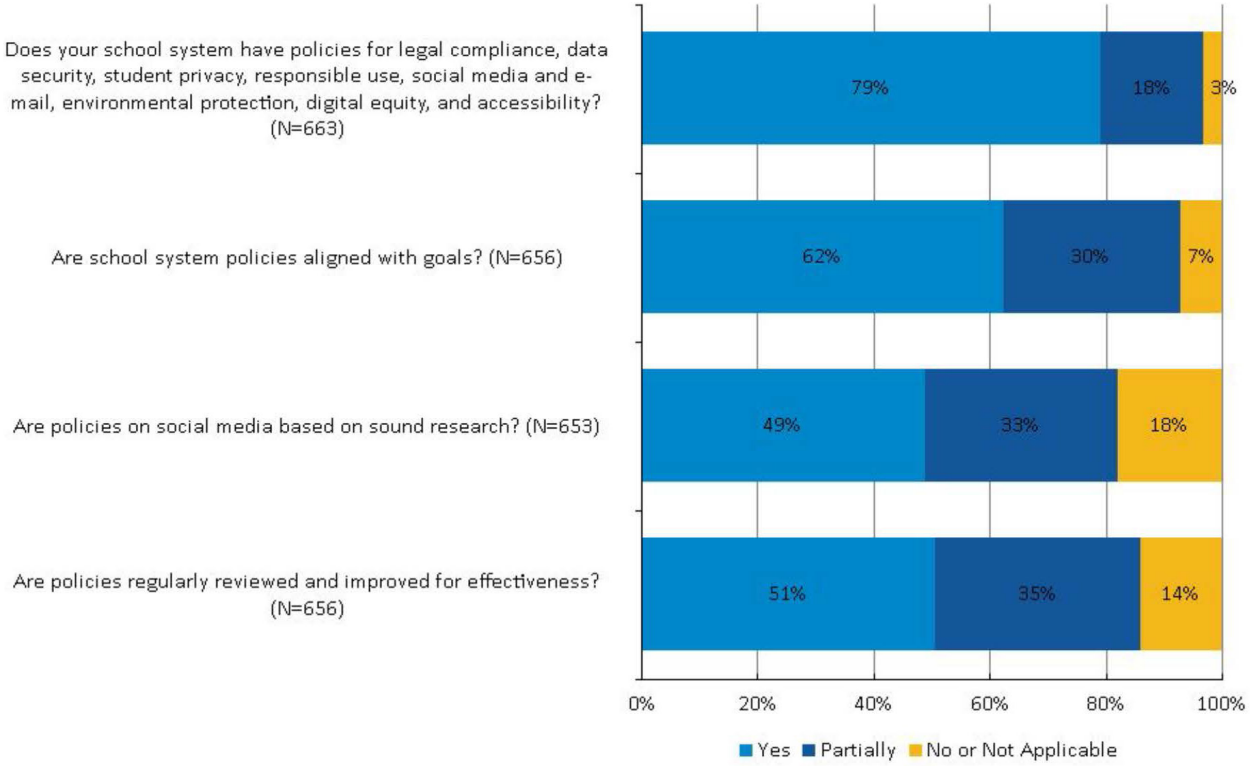
Case Study

One of the Peer Review school districts really stood out in their stakeholder engagement and community buy-in for its technology vision. This district held 50 community meetings to allow for community input on the priorities for their next strategic plan. The momentum

for 1:1 technology in the in curriculum came from those meetings from parents and the broader community as well as newer teachers. Since this is a relatively rural district, parents saw neighboring districts with technology and built a coalition around increasing technology for their district. The district also started visiting other school districts with successful 1:1 implementation for advice and accelerated buy-in from the faculty.

This is an exemplary example because it shows that in districts where the educator's perception of acquiring technology is the **"pursuit of the next shiny thing,"** administrators and technology leaders can elicit community input to push the needle forward through community engagement. They also elicited faculty support through observation of other districts and educators. K12 edtech leaders say the greatest challenge they face in implementing digital learning or expanding technology use is motivating teachers to change their traditional instructional practices to use technology more meaningfully with students (CoSN Mobile Learning Insights). This is applicable to other technologies that districts want to implement as well.

Ethics & Policies



Best Practice: The school system leadership team models responsible decision-making and manages the creation, implementation, and enforcement of policies related to the social, legal, and ethical issues linked to technology use throughout the school system. Particularly, Digital Equity and Cybersecurity are priorities that are defined for each district with policies in place.

Digital Equity

The biggest area for improvement as well as possibly the biggest challenge is digital inequities. Although each district had their unique challenges some were better at addressing it than others. Some practices that stood out as best practices were districts that even prior to the pandemic collected data about which families have Internet connection issues, so the district was able to reach out to them specifically when needed. The difference between this and other districts is that their system is procedural where other districts rely on word of mouth from educators.

Building on that, establishing a policy for the district to consistently address existing Digital Equity issues is important to addressing them. Part of that should state that all families have access to home internet and ways to work with families that don't. If your district can't say that you are 100% confident that every student has a working device and access to the internet, there is still work to be done. Continue to be creative with financial resources and strategic partnerships to close the digital divide. Access to a device and connectivity is only the first step with much work to be done around the digital use gap.

Digital Citizenship

In every review digital citizenship practices were highlighted. Most districts/systems needed to build a curriculum around digital citizenship; it became an immediate problem during the pandemic when students had to learn appropriate behavior on the spot in a virtual environment. Some districts that were looked at had some great ways of implementing and enforcing digital citizen policies. Their best practices were to develop a clear and consistent vision for digital citizenship education in all schools with a defined curriculum. Also to dedicate instructional time focused to prepare students for digital learning. Successful programs also train parents in digital citizenship and mention it as a priority in the strategic plan. One district had a "boot camp" where they included the whole family in the training. For school districts that want to get started developing their curriculum there are software

apps available to promote digital citizenship programming at all grade levels, but it is best to pair it with live instruction. The best way to advance in this area is to ensure that there is a staff member who is the "owner" of the digital citizenship curriculum.

Policies

Technology policies should be reviewed on an annual basis to ensure they are current with all laws and regulations in your state. Policies should also be shared with your Board of Education on an annual basis. Here is a list of policies that every technology department should have:

- Network Security Policy with a password policy and ransomware response component. This policy should not be a public document.
- Software procurement and management policy to formalize the vetting process for software applications.
- Records retention policy to include email archives and Student Records Policy.
- The Acceptable Use Policy should be a Board level policy. Create two versions of this policy: one for employees and one for students, to address the unique uses of technology by each group.
- Social Media Policy
- Cybersecurity Response Plan
- Inventory Management Policy

A potential problem with any policy is enforcement. The policies that districts had the most challenges enforcing were authentication security and password management. Network passwords should be complex and include special characters as well as have a required refresh. A secure password policy includes a 60/90 - day password reset policy for all accounts regardless of the user. Also systems/districts should consider using two factor authentication (text codes or tokens) for administrative personnel with access to sensitive information.

Cybersecurity

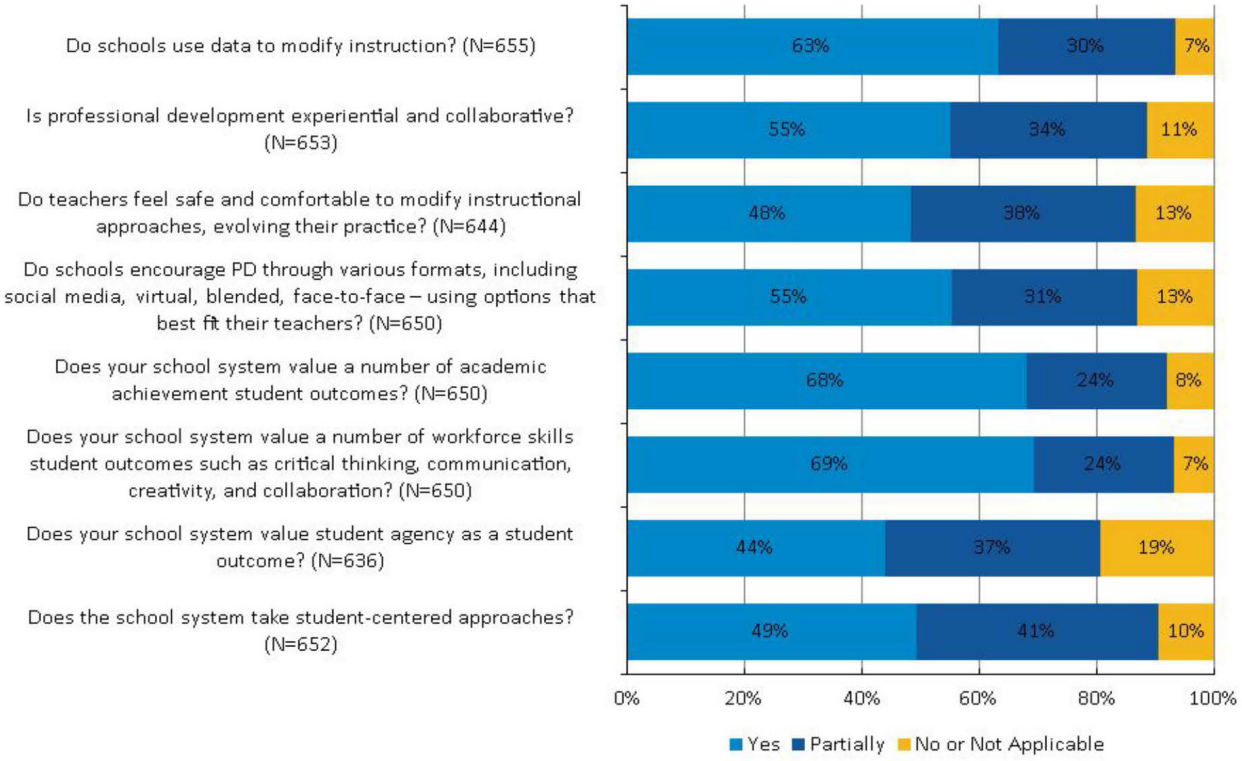
Cybersecurity was an important topic that came up in all Peer Reviews. Almost all districts had work that needed to be done to ensure that student and district data is as secure as possible. Some of the best practices were that school staff were trained and tested in their ability to spot phishing emails and the district technology department distributed a phishing newsletter to all staff. School staff were also trained on the importance of protecting student data privacy. The cybersecurity policy should detail and define specific plans in response to a distributed denial-of-service (DDoS) attack, ransomware demand and the hacking of sensitive student data.

School districts that need to work on their cybersecurity and student data privacy policy may benefit from participating in the Trusted Learning Environment (TLE) Seal application process, which is a student privacy framework developed by CoSN with support from both the Bill & Melinda Gates Foundation and Michael & Susan Dell Foundation. The TLE offers a structured and rigorous approach to privacy policy development. Achieving the seal has been described by participating school districts as a significant achievement. Trusted Learning Environment (TLE Seal)

Application Approval Process

Only a handful of Peer Review districts did not have a list of approved applications for faculty and student use. The best practice is to have a standardized process that includes approval by the technology department to verify additional software applications are necessary. The districts that did it well, had a list of approved apps published on the district website so that parents have access to the resource and ensured teachers were aware of the application approval policy. Having a written policy as well as a flowchart documenting the approval policy is a gold standard. Each new application needs to be evaluated for privacy breaches. The best applications are those that are not redundant and are compatible with other school systems and kept the backlog clear. Applications that are not on the approved application list should require parental notification for each individual user if the app collects student data.

Instructional Focus & Professional Development



Best Practice: School system leaders budget, plan, and coordinate ongoing, purposeful professional development using technologies for all staff.

"The greatest invention ever was the pencil." - Self-described "Technology Dinosaur."

A common finding among all Peer Reviews was that the district needed to develop more awareness and offer more professional development opportunities for staff. Technology is somewhat unique in education with its fast pace of change. It requires planning to ensure that staff skills keep pace with changes. One way that districts can do that is by having supervisors develop career paths for their staff through continuous learning and certification. Particularly for districts where there is low turnover, staff may lose the motivation for professional development, thus having room for upward mobility is important. Those districts that succeeded in implementing effective and contemporary approaches to instruction and professional development included it as part of their strategic planning.

The district should build the capacity of building leaders to model and mentor professional staff with research based effective approaches to the integration of instructional technology and personalized learning in the classroom. Establishing a teacher leader program is a great way to integrate everyday professional development and support. It is best practice to have one lead technology teacher present in every building to support instructional technology and curriculum development. It is also important that new employee onboarding processes have specific training to promote instructional practices using technology.

"Putting technology in the classroom is different than implementing technology in the classroom."

Evidently there is a trade-off between implementing new technologies and the time that it takes from educators to learn them. In multiple peer reviews teachers desired additional training and time for learning, practice and innovation. There were many teachers that said their biggest barrier to achieving digital competency was time. In one of the participating districts' they had time set aside every Wednesday for teacher collaboration and professional development. Teachers there reported tremendous value in having this dedicated time to build their peer relationships across the different schools and share best practices. Making time for professional development in your district is critical to implementing new technologies.

When to adopt technology in the classroom?

In a few schools, K12 edtech leaders felt like technology was adopted just for cost and not instructional specifications. Instruction and technology departments should work together to make technology decisions and develop clear understanding by stakeholders of how instruction drives technology decision making. Districts that want to make smarter technology decisions should consider adopting research-based instructional technology standards and/or strategies (ISTE, SAMR, TPACK) for integration of technology with the leadership of a K12 Curriculum and Instruction Professional Staff member.

Personalized Learning

School systems/districts are increasingly moving toward personalized learning and enabling student agency. The pandemic has highlighted a need for more personalized learning, especially in an online learning environment. School systems/districts should begin to develop pilot programs while the community and parents are still thinking about it. Students interviewed in a few districts shared that one of the benefits of remote learning was their

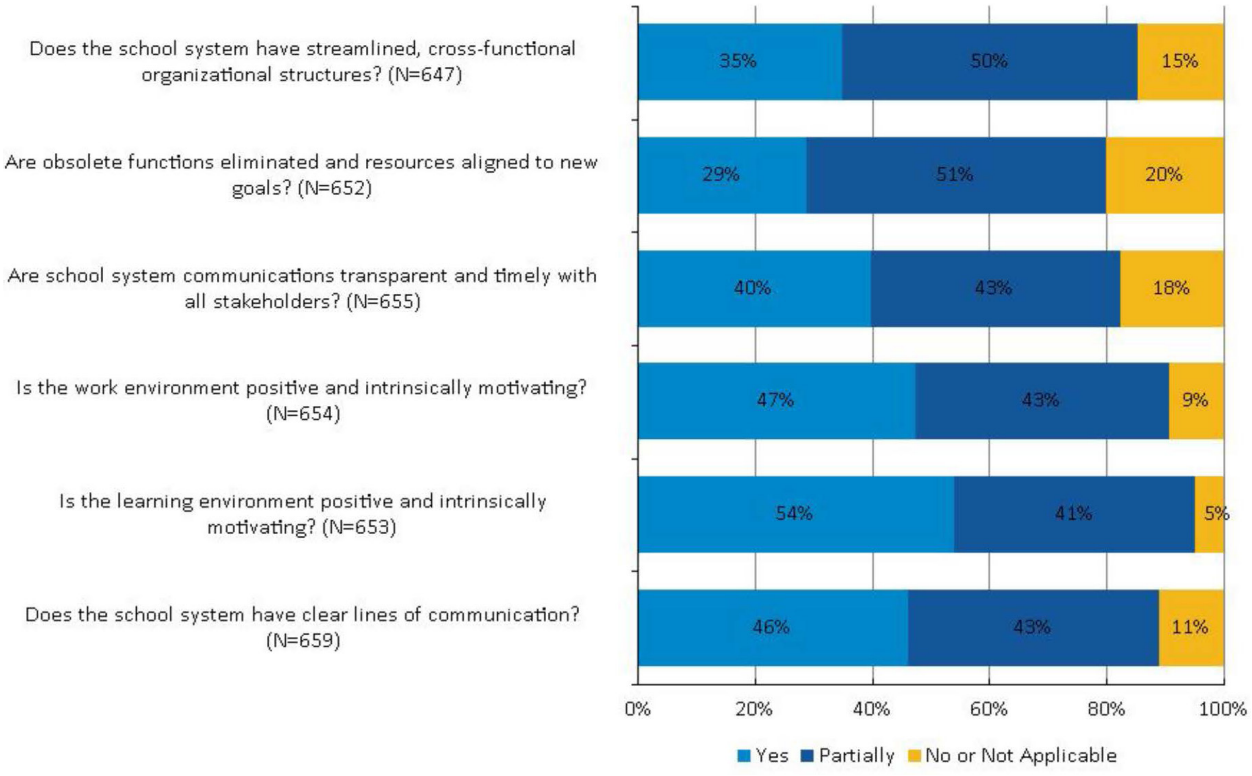
ability to work at their own pace. While students and parents are pushing for the change, educators will need time to adapt.K12 edtech leaders (67%) say that the greatest challenge they face in implementing digital learning or expanding technology use is motivating teachers to change their traditional instruction.

"Some programs in technology do not make sense and decisions are not data driven in selection of some of these programs."

Getting Rid of Applications That Aren't Needed

Similar to the application management and approval process discussed in the last section, districts need a process for culling applications. Too many apps lead to teachers feeling overwhelmed with the need to learn all of them. It is a best practice to pursue deep mastery of initiatives prior to adding others. Cut unused applications based on quantitative user data.

Team Building & Staffing



Best Practice: School system leaders create and support cross-functional teams for decision-making, technology support, professional development, and other aspects of the school system's technology program.

Technology Staffing Levels

While almost all Peer Reviewed departments did not self-identify as needing additional technology staff, CoSN reviewers often recommended additional staff compared to regional peers. It was also always recommended that leadership continue to monitor IT Technician staffing against functional areas for alignment to projected needs. As the use and number of devices grow so will the need for a robust system to quickly resolve software and hardware issues. School systems/districts should compare themselves to peer districts and the amount of technology staff they have to the number of devices. CoSN does this as part of their Peer Review process.

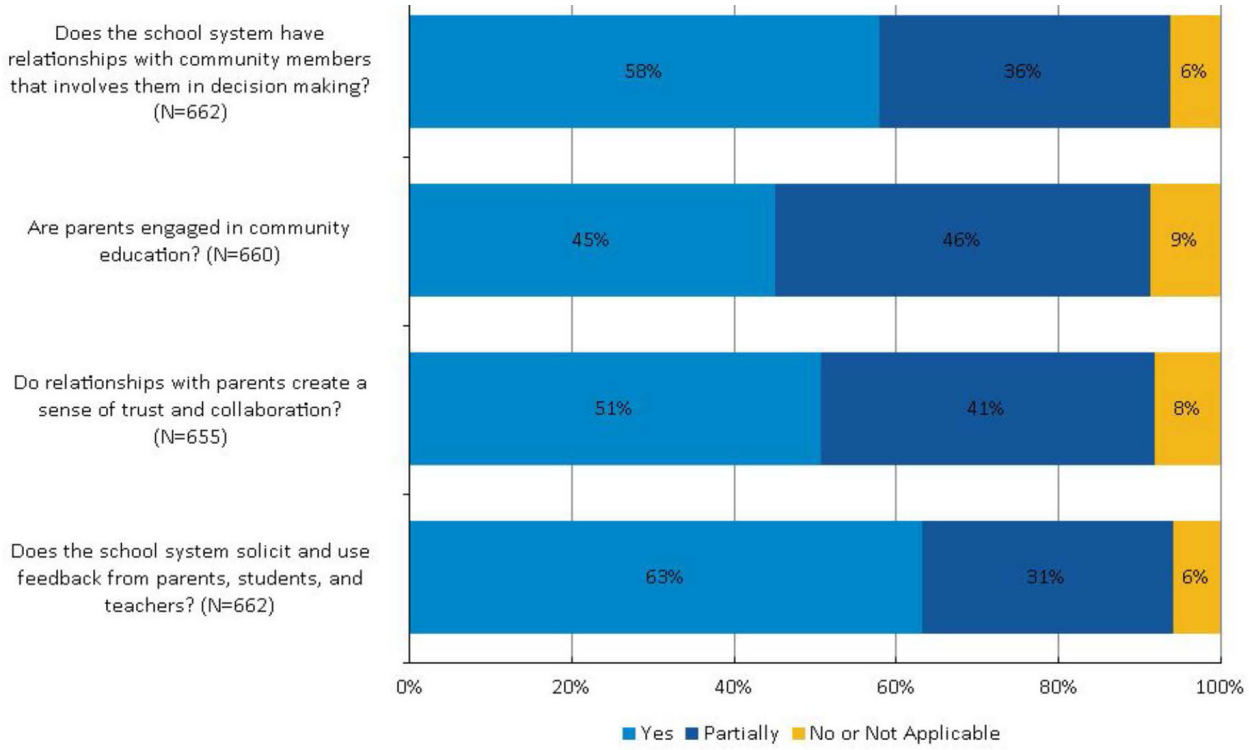
Cross training was also an important aspect of technology staffing. Some districts did this well, while others struggled. It is best practice to create some redundancy and overlap between positions to ensure the district will function when a single staff member uses leave time. One position should not be solely relied on to perform critical functions.

Technology Department Professional Development

All of the Peer Reviewed districts could benefit from more professional development offering specifically for technology department staff. One way that Peer Review districts ensured that their staff were trained and prepared for their positions was by encouraging their team leaders to earn their Certified Education Technology Leader (CETL) certification. The CETL certification is a widely accepted certification for senior IT leaders in K12 education, with a network of more than 750 CETLs domestically and abroad. For technology staff that are entry level, there should be professional development opportunities and specific tracks for increasing their skill level.

Additionally, the district technology team should continue to be open to honest self-examination that includes relentlessly assessing department processes. One way that they can do this is to participate in a CoSN Peer Review or allow other outside parties to review their processes. For best results rotate external auditors periodically. Staff leaders should encourage a culture of continuous improvement and evaluate past projects for further improvement.

Stakeholder Focus



Best Practice: The school system builds trusting relationships with all stakeholders. They do this through community conversations and purposeful engagement around technology planning.

One way that all of the districts succeeded in listening to their stakeholders was including their voices in the Peer Review process. Stakeholders that were interviewed for the Peer Review included: school principals, parents, educators at different grade levels and subjects, directors, superintendent, school board members, students, technology staff and managers, and media specialists.

Most of the feedback in the stakeholder focus was around building stronger relationships and trust with stakeholders. Additionally, clear communication of the technology department's progress and needs within the district and the broader community. Overall, stakeholders want to be part of the technology planning process and it is best practice to find ways to

include each of their voices. Some of the ways that the Peer Review districts engaged key stakeholders were the following:

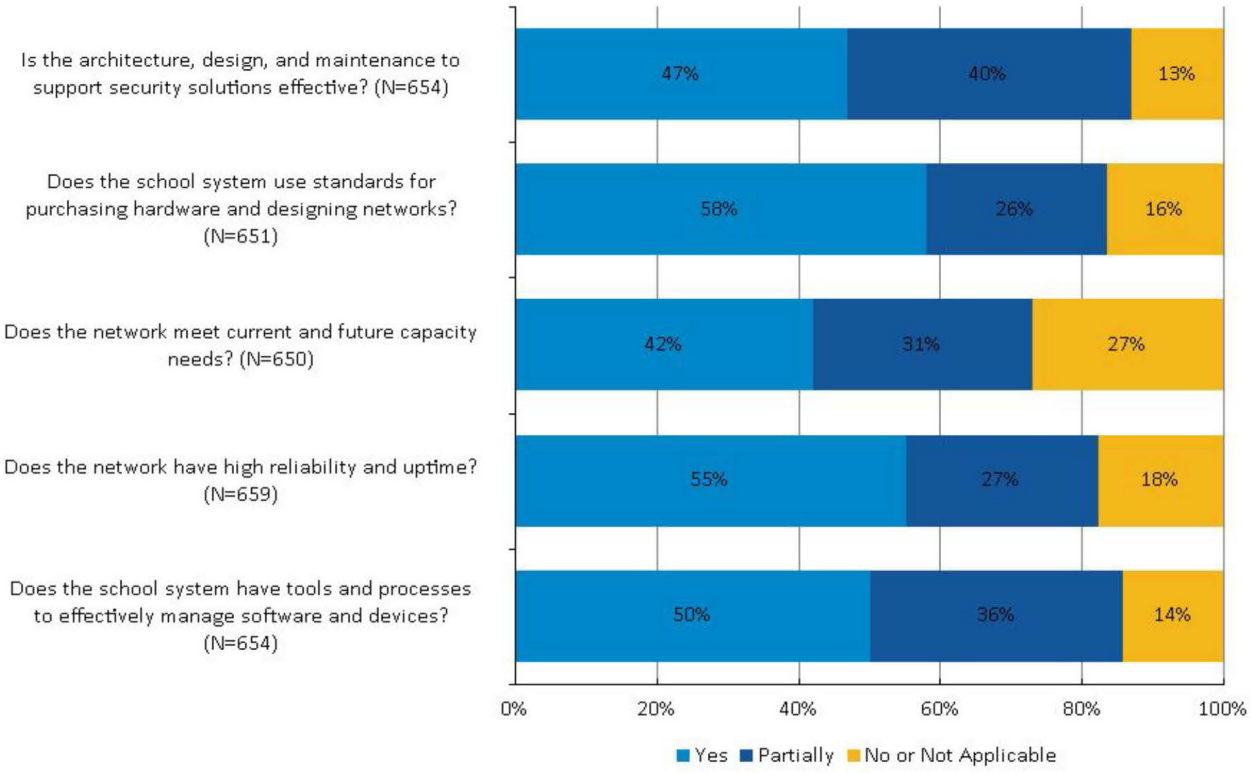
Broader community: holding public meetings to garner feedback and committees to process the feedback. Using the feedback in the strategic plan. Organizing and getting active in School Board meetings and voting when issues go up to the ballot.

Parents: The school district values the opinion of its parents and seeks input from parents as needed. All schools said parent participation has increased with online offering of meetings. Districts have benefited from input on technology decisions/matters. Some of the best practices identified from the school districts that included parents are monthly parent leadership meetings which include the senior technology leader/CIO/CTOs, and surveys for parents on curriculum and school performance, particularly with technology.

Senior executive level to other staff: Clear and consistent communication around the strategic plan and technology initiatives. Participate in a Peer Review to solicit staff feedback. Establish building and district level technology committees that will provide authentic user feedback to district decision making.

Technology department to broader district: Ensure that technology policies, FAQ, strategic plans etc. can all be found in a shared document. Create a Technology advisory committee comprising district staff, students, school building leaders and parents to help develop technology plans.

Infrastructure



Each district should have adequate bandwidth and failover internet configurations to support current instructional and operational technology needs. Continuous monitoring of internet bandwidth is necessary to identify when it's appropriate to increase bandwidth with the addition of new devices and curriculum changes. Bandwidth decisions should be based on peak usage. When in-school instruction resumes, the school district should be prepared to increase bandwidth as needed by applications and a full-time in-school presence.

Connectivity speeds of 1 GB per 1,000 students per school is a national long term goal set by the Federal Communications Commission for students. School districts should be proactive in their planning to meet that goal. Thirty-six percent of K12 edtech leaders responding to a CoSN survey indicated that they are pursuing a longer term goal of 1GB per 1,000 students. (Source: CoSN State of EdTech Leadership in 2020). For example, a school with 1,000 students and a mature 1:1 implementation would aspire to 1 Gbps of connectivity.

Consistent Infrastructure Planning & Replacement Cycles

Some districts that had lower technology budgets had aging gear which exposes the district to the risk of downtime and security breaches. Budgeting for infrastructure refresh avoids surprises for administration. The technology leadership team should develop an established replacement cycle for all technology equipment. CoSN Peer Reviewers recommend refreshing servers and switches every 7 years, staff devices every 4 years and student devices every 3-4 years. One district had developed a swap out model for Chromebooks with 10% of total devices serving as spares so that students do not have down time.

Cybersecurity - "You're only as strong as your weakest user."

All of the schools that were peer reviewed had changes that needed to be made to their cybersecurity policies. Every district should develop both proactive and reactive strategies, processes, and documents to address cybersecurity threats. It is best practice to continually improve existing privacy and cybersecurity practices. If a district does not have a position focusing on cybersecurity issues already, it should hire someone ASAP. That position should focus on the following:

- Adopting a cybersecurity framework,
- Creating a program to identify risk,
- Developing a plan to mitigate critical areas of risk and designate a Cybersecurity Coordinator to report all incidents.
- Developing a cybersecurity training program that ensures cybersecurity awareness in all employees and elected officials. Verify and report on the completion of a cybersecurity training program by the required employees and elected officials.
- Establishing a process for periodic audits to ensure compliance with the training requirement. This includes determining who needs to be trained and selecting a training program. And, determining when employees will be trained and determining what tool will be used to perform the periodic audits.

Other best practices include conducting regular cyber phishing training through the distribution of simulation phishing emails, and following National Institute for Standards and Technology (NIST) standards to manage student data privacy. Technology staff should be leaders in cybersecurity mitigation and be trained as a group on mitigation tactics. The district should also adopt a cybersecurity training platform to test its community of users to recognize and deter social engineering attacks via email, telephone, and SMS messaging. Testing should occur bi-monthly initially.

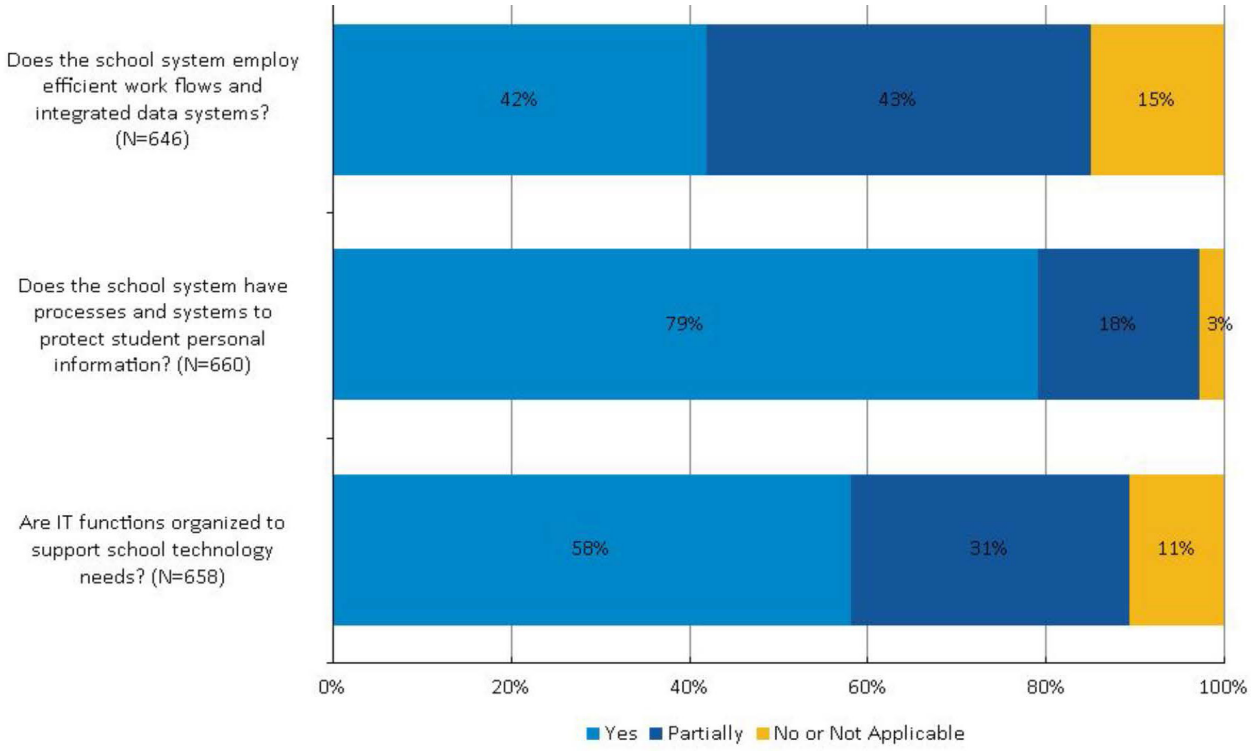
In most of the districts studied, the stakeholders felt that they had the right amount of training to understand the threat posed by phishing scams but less knowledge on management of student data, password protection, end user training and mitigation.

"The ticket to nowhere."

A few districts had issues with their ticket management system to the extent that one respondent called it the "wild west." Part of that is developing communication protocols around the acknowledgement of support tickets and ensuring that automated routing is current and clear to staff members entering tickets. Tickets should be triaged and then assigned to available responders in a systematic manner according to the technicians' availability and skillset. Supervisors should review tickets daily to ensure that tickets are being addressed and closed out in a timely manner and according to predefined standards. Key Performance Indicators should be developed with a minimum initial response time, escalation procedures mapped to specific skill sets within the technology department.

It is best practice to have accountability structures around ticket management and resolution.

Information and Data Management



Best Practice: The school system the data programs that are needed for operations and instruction. Interoperability is a large component of this.

Interoperability

It is best practice to create interoperable systems whenever possible, where the Student Information System is the primary data source that drives all integration pathways. To do this some school districts have created interoperability roadmaps. This identifies how data is collected and documents the process. Interoperability should be a dominant factor when making purchasing decisions. Two of the school districts in the Peer Reviews took the extra step to create an interoperability matrix that involves staff answering questions on their interoperability practices. If other districts want to participate, they can find additional information in Appendix B. Leadership should work to continuously improve these capabilities for improved data accuracy and reduced implementation and operational costs. CoSN's interoperability resources

To help with interoperability it is best practice to have a data dictionary that is available to data management stakeholders, not just the technology department. Shared dictionaries ensure that the meaning, relevance, and quality of data elements are the same for all users. They also provide a roadmap for the sharing of data between databases to ensure that the correct data fields are identified in all integrations.

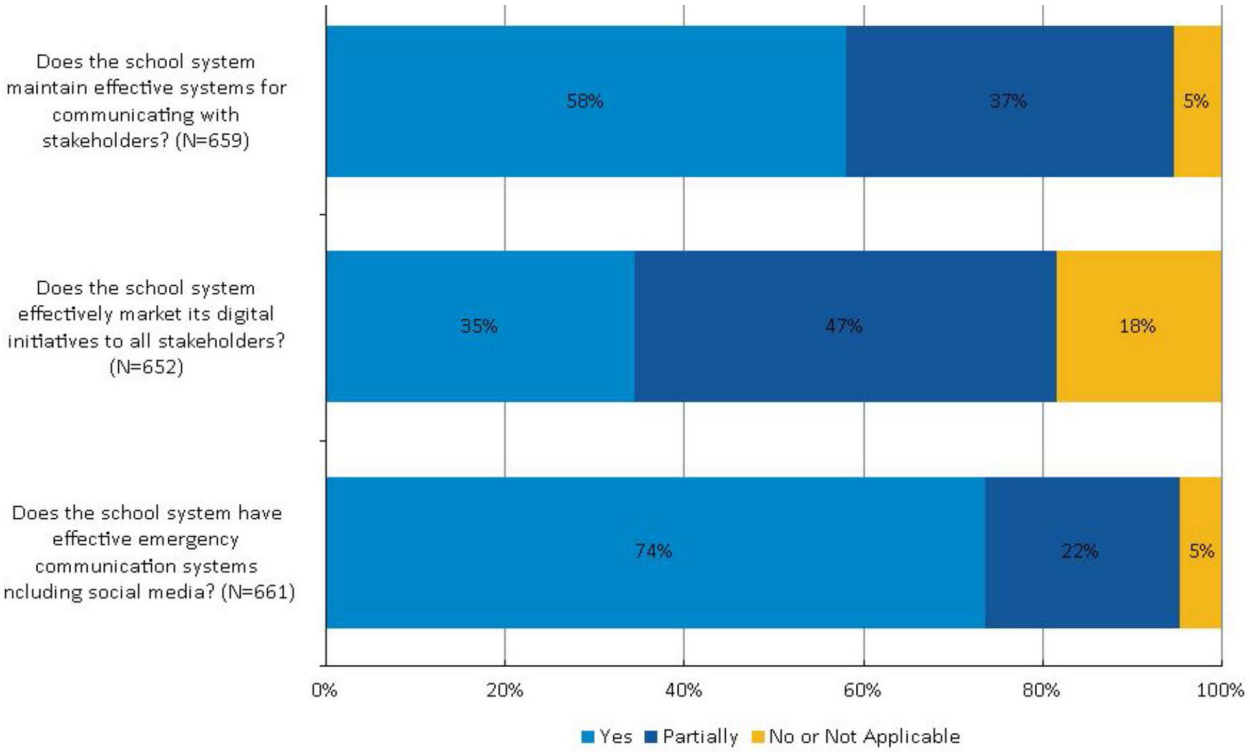
Transparent Dashboards

It is best practice to have transparent dashboards to measure and report district performance against associated Key Performance Indicators. The Technology/Information Services department should be accountable for maintaining districtwide dashboards. If districts didn't already have them, most stakeholders were interested in accessing dashboard information relating to their job requirements.

Privacy of Student and Employee Data

In the worst case scenario there were no student data privacy training sessions.Districts should not rely heavily on their vendors to implement student data privacy standards as part of their systems. Training on FERPA and other relevant federal, state, and local data privacy policies should be part of the professional development curriculum in all areas of operations and academics.

Communications Management



Best Practice: The school system manages the platforms and messages used to communicate transparently with internal and external stakeholders, effectively using both emerging and mature technologies as appropriate.

Parental Communication

Some districts needed to work on clear communication to parents around daily operations, strategic direction and technological support. Especially consolidating the amount of communication channels and frequency with which they communicate with parents. Many parents complained that there were too many platforms to access different information.

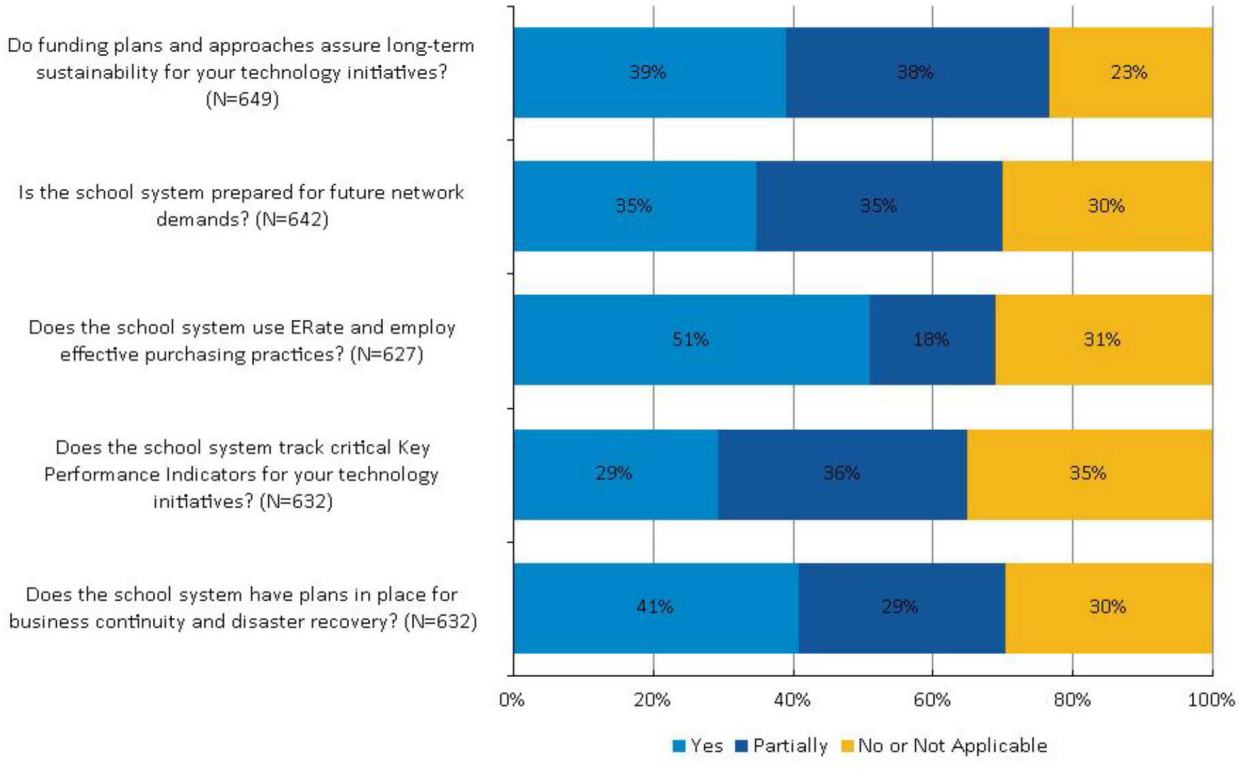
ESL parents found it particularly difficult when translation services were not offered. One of the districts studied was particularly good at accommodating ESL parents. This district has Somali and Spanish speaking cultural liaisons. They also had staff resources available to aid in translation for every primary language used in the district. Their emergency communications

are also distributed in multiple languages including Russian, Korean, Somali, Spanish & Chinese. Communications should be available in multiple languages for students and parents whose second language is English.

School District Website

The design of the website is professional, modern and clean. There is a designated webmaster and staff that maintain individual school web pages are trained and have the correct permissions to do their tasks. Formalizing the role of webmaster creates a more consistent website experience. Many of the school districts had broken links on their websites. It is best practice to create a weekly process to ensure that broken links on the website are discovered and fixed quickly. Website should be ADA compliant. It is also best practice to have multi-language capabilities available when accessing the website. Accessibility is essential for leveraging technology and providing educational opportunities for all students. Digital 508 compliance is a standard that ensures wider access to digital information provided to the public. See the Digital Accessibility Toolkit in Appendix B for more information.

Business Management



Best Practice: The school system manages budget, financial operations, disaster recovery, and business continuity effectively.

Cyber Insurance

A common observation for our districts was the need for comprehensive cyber insurance coverage. According to the 2020 CoSN State of EdTech Leadership survey, nearly three-quarters (74%) of the survey respondents' budgeted for cybersecurity insurance. More than half (56%) purchase coverage as part of a comprehensive policy and 18% purchase separate cybersecurity insurance. A fifth of respondents don't carry cybersecurity insurance but another 5% have plans to purchase. It is a best practice to purchase a comprehensive cyber insurance whenever the risks outweigh the costs for the district.

Data Backup

School districts should have the goal of backing up all of their data into the cloud, as a part of a continuity plan, thus protecting data integrity and providing a reasonable defense against cybersecurity threats. Seventy three percent of Ed tech leaders surveyed by CoSN agree that backing up all information and storing it offsite is a highly desired practice. (Source: CoSN State of EdTech Leadership 2020). Alarmingly, some districts did not have the ability to restore data beyond a month. To successfully protect data in the event of a Ransomware attack, a 12 month look back period is strongly recommended. Additionally, the technology department should test failover functionality at least once a year as part of the business continuity plan.

Technology Budget

The districts that had the strongest technology budgets leveraged all funding sources available to them, including maximizing their community levy, federal funds like E-rate and COVID relief packages and ensuring that the district is allocating an appropriate amount of money toward the technology budget in the district budget. Your district can compare to other districts using the 2021 CoSN IT leadership survey. Some of the key trends from that survey were that the majority of leaders, 56%, reported an increase in available funds and the majority of respondents reported IT budget increases in two areas— Curriculum Software/ Subscriptions (62%) and Cybersecurity (56%).

Asset Management

DIstricts should have one list that tracks all inventory and equipment. A few districts had this information in different places which made it difficult to tie equipment to the finance system and ticketing system. A master list also allows the district to generate reports on the maintenance of devices, the average cost for repair and data to inform practice. Additionally that information can determine which school districts have greater breakage and mitigation strategies. Without this list it is impossible to systematically replace equipment and develop a sustainability plan.

Conclusion

There are many areas where most school districts can improve. The best practices outlined in this report were taken from CoSN's conducted Peer Reviews and supported by CoSN's IT Leadership Surveys and the Digital Leap Success Matrix. For additional CoSN resources to help your district achieve your goals, see Appendix B where we lay out the best resources for each matrix area. If your district would like to participate in a Peer Review and get personalized professional advice, more information on the review process is available in Appendix C.

Blog 1: Innovation

Desert Sands Unified School District (CA), is a leader in educational technology, digital equity and innovation. I had the great opportunity to sit down (virtually) with Kelly May Vollmar, the Assistant Superintendent of Educational Services and CoSN Board Member. We chatted about her school district's experience in the pandemic and what the school district is working on in EdTech for the next school year.

Q: What are the biggest lessons you learned from transitioning your district to online learning?

A: The biggest lesson we learned was how to deliver instruction online. This is something that we had to learn and execute in one year, which would have otherwise taken about 5 years to achieve. It surprised me at how much training was needed for educators, parents, and students in technology to successfully deliver online instruction. Additionally, we learned to be more flexible. Teachers had to work around students' personal situations and circumstances and home unlike anytime before.

Q: What would you consider your district's greatest success in Educational Technology in 2020?

A: I would have to say I am most proud of our teacher training program. We started developing it right at the beginning of the pandemic. We now have 3 types of training for our educators: required training, at your own pace, and additional optional training for educators that want to develop their knowledge further. We also did professional development for parents at home to help them with technology for their students and converted our help desk which was traditionally for staff only to include parents and students. It was a huge success.

Q: Your district transitioned relatively smoothly to online learning compared to others, what eased your transition compared to other districts?

A: Desert Sands was ahead of many other schools when the pandemic hit because we were already 1:1) and had our own LTE network. Since those two key challenges were already out of the way, professional development and ramp up was the key obstacle.

Q: What are some of the permanent changes to learning that would only have happened because of the pandemic?

A: I think personalized professional development is here to stay, we certainly want to keep doing it whenever possible in our district. Right now, as we shift back to in person, we are trying to keep the pressure on staff to continue to use technology in the classroom. The opportunities for lesson design with technology are endless and we want to ensure teachers are still incorporating it even when they don't have to.

Q: What is the greatest challenge for your district moving forward regarding educational technology?

A: The greatest challenge for us is that we need more professional development for our EdTech staff and are looking to hire new positions to support our help desk and other initiatives. I am most afraid of stifling innovation, particularly in this sector, which is why I always encourage my staff to attend conferences and other networking events so they can learn from others and build their professional contacts.

Q: What direction do you see learning moving toward in the future? What opportunities do you see for your district that would have been unimaginable pre-pandemic?

A: The future of EdTech for my school and many others is the addition of a full-time virtual learning academy. Even before the pandemic there were kids that were leaving the district to do online schooling. Instead of losing those kids to other schools, we want these students to continue to attend our district. It is a way that our school is staying competitive and changing with the needs and demands of our students.

Q: What are you most excited for this coming school year?

A: Even with all the talk technology -- I am most excited to have all our students back in person. Just for our students to have a real sense of normalcy again.

Blog 2: Cybersecurity

Cybersecurity: Offense is Your Best Defense

2020 marked a "record-breaking" year for cyber-attacks against schools and CoSN's 2021 IT leadership surveys found that cybersecurity remains a top concern among chief technology officers across the nation.

I spoke with David, the Director of Information Services in a smaller District (~5000 students) in the Midwest about what his District is doing to prepare for cyber-attacks this school year.

Their core philosophy is that **attacks are inevitable**, but the District should do everything they can to reduce the impact of them.

The following are the key success factors of their cybersecurity defense plan:

Professional Networks. Professional networks have been critical in supporting efforts to increase cybersecurity practices and funding. Their District meets monthly with a county-wide Technology Consortium to exchange ideas and talk about best practices with Directors and Sysadmins. This is where many of their Districts' successful ideas emerged - once one District adopts something, others tend to model in similar ways. *Local, State and National consortiums like CoSN provide best practices for combating cybersecurity.*

Artificial Intelligence Detection System. Purchasing an AI system has greatly improved the District's capabilities to detect and respond to attacks. The decision to purchase the system came when the District was considering hiring another staff member or two to manage cybersecurity threats. While the system isn't cheap, it is able to detect threats 24/7 and is faster than human capability. The software was purchased under a 5-year contract and is able to detect any suspicious activity and isolate it before it spreads through the entire system. Part of its success is the work that the District has done on interoperability, ensuring that the AI system can find threats in the cloud, data center, internal network, or IoT devices. It analyzes behaviors of devices and data to detect new threats. Most cybersecurity platforms are moving to subscription based models to stay current with the growing threat environments with cloud based AI. This allows customers to scale capability and cost where it makes sense. *AI-driven threat detection is effective at preventing attacks and is a tool that IT leaders should consider purchasing for their cybersecurity arsenal.*

Data Backups. Part of planning for cybersecurity is being realistic about its occurrence. Loss of data by way of crashes or breaches can wreak havoc on internal systems. Data backups are key to this District's comeback strategy - they currently have several backup models with the focus of being immutable and air gapped. Data backups ensure that they can recover data if it is stolen or lost within an affordable time frame. *Districts need multiple places to backup data both in the cloud and on prem; it should be scheduled and tested frequently.*

Strict Policies and Procedures. David's District has struggled with the tradeoff between protection and autonomy, but they understand the risks at stake. Their Technology department made the decision to withhold Administrative rights exclusively to the Technology team. They provide a Software Store for staff to install pre-approved applications at their leisure. The key is to provide the software but keep the security posture in place. They are also working toward MFA for all users. This helps secure users on edge devices that may have a higher level of access in the system. *Centralizing administrative rights to the technology department protects student data privacy and lowers the risk of vulnerabilities in the system.*

External Audits. Their District participates in annual audits of their cybersecurity practices to identify weaknesses in their system. They also change the vendor that does their audit from year to year to gain a diverse set of recommendations and action items. For Districts that don't have large technology budgets there are lots of free tools online that are a good starting point to discover best practices including CoSN's Cybersecurity Toolkit. Districts should continually assess what they can be doing to improve their defenses as the landscape is changing almost hourly. *Annual or Semi-annual audits are recommended to Districts as threats continue to evolve.*

Blog 3: Sustainability

Don Ringelestein is the Chief Technology Officer for Maine Township High School District 207 in Illinois. He oversees all aspects of technology, implementation, enterprise systems, security, purchasing and vendor/project management for multiple locations. The school district has developed a sustainable model for supporting technology lifecycle management programs for all their devices, including the 800+ devices purchased during the pandemic with one time funding.

The key elements of their sustainable purchasing model are:

- The inclusion of multiple stakeholders in the creation and implementation of their plan.
- Assessment of devices by multiple stakeholders before purchasing.
- Continual testing for usage of applications and purchases for maximal cost efficiency.

The first step toward sustainability is planning. Don's district has a comprehensive budget plan for purchasing devices each year. The money for this is built into their operational budget. The following is an example of a sustainability plan from Don's district.

August	• Budget approval
January	• Chromebooks in the market are identified and evaluated for purchase features
March	• Sampling and testing of selected devices • Formal bid put in by vendors
April	• Bulk purchase is made
May-August	• Devices distributed to new students

In August, staff gets budget approval for purchases. In January, the Technology Team identifies Chromebooks as their preferred vendor and rates them with a focus on features (including form factor and input methods), technical specifications, durability, price and warranty and shipping date. In March, the school receives samples of the chromebooks they are considering for their next freshman class. Then they go through an evaluation process which includes input from Student ChromeDepot Tech Genius', teachers, instructional coaches, Technology Team leaders at the district- and school-level and students. Using forms and focus groups they decide on their top choices and then the district receives formal bids for each model from vendors. Final selection of a Chromebook is based on the student and staff evaluations, pricing and warranty coverage, and availability provided from re-sellers and manufacturers.

In April, the purchase is made and in may-august the freshman students receive their devices. Part of their sustainability plan is that students keep the same device throughout their highschool experience. They pay $75 their freshman year and can keep it when they graduate.

Another aspect of Don's sustainability plan is handling repairs in house. Each school has a ChromeDepot located within it that manages school repairs. The ChromeDepots are staffed by the District technology team and students and they provide most services free of charge. The district maintains sufficient loaner devices which are loaned free of charge to students in the event that they need to keep the Chromebook for repairs.

Other sustainability practices include reviewing total cost of ownership and usage. For example, the district will see how much paid applications are actually being used and if there are potential duplicates that do the same things. Part of this is having a documented inventory of all devices and their locations.

Don's model is just one of many, but all sustainability plans require the same design elements and considerations. Here are some questions to consider when creating or editing your own sustainability plan:

1. How far out does your technology roadmap go? 1 year? 2 years? 5?
2. Who should be included in your technology sustainability plan? What stakeholders are you currently excluding that should be included?
3. What systems do you have in place to check for redundancy of applications, devices, software? How often are they being checked?
4. What is your plan for device repairs?

Appendix A - Digital Leap Success Matrix

Digital Leap Success Matrix
https://www.cosn.org/sites/default/files/Digital%20Leap%20Success%20Matrix_0.pdf

Appendix B - CoSN Resources

Leadership and Vision

Superintendents can make or break any or all educational technology initiatives. They are responsible for ensuring that their school districts embrace transformative digital learning. CoSN collaborates with superintendents to assess their challenges and increase their capacities to lead technology efforts. The Empowered Superintendents Toolkit is done in partnership with AASA.

Rate your senior leadership team to determine your readiness to implement effective edtech learning environments in your school system. (Attached)

CTO Self-Assessment

Superintendent Self-Assessment

Lessons learned, Quotes from the Field. CoSN conducts the State of Ed Tech Leadership Survey annually. This is a collection of quotes from school district leaders dealing with a variety of issues in 2020-2021-attached.

Strategic Planning

Key Performance Indicators

Key Performance Indicators directed at the K12 community are available through the Council of Great City Schools . IThese KPIs have been carefully vetted by CTOs in the K12 community and are commonly used in many districts to measure and compare performance of network services and devices year over year. The technology metrics deployed include the following:

- Devices - Average Age of Computers
- Devices - Computers per Employee
- Devices per Student
- Devices - Advanced Presentation Devices per Teacher
- IT Spending Percent of District Budget
- IT Capital Investments Ratio to Operational Spending

- IT Spending per Student
- Network - Bandwidth per 1,000 Students (Mbps)
- Network - Days Usage Exceeds 75% of Capacity
- Network - WAN Availability
- Support - Break/Fix Staffing Cost per Ticket
- Support - Help Desk Call Abandonment Rate
- Support - Help Desk Staffing Cost per Ticket
- Systems Cost - Business Systems Cost per Employee
- Systems Cost - Instructional Systems Cost per Student

Formulas for the key performance indicators are available here.

Ethics & Policies

This report on the preliminary findings of a breakthrough study on students' at-home internet connectivity and provided guidelines on bandwidth, devices, and other remote learning needs based on the data. The study fills a critical need among educators and policymakers for detailed insight on students' learning experiences at home during the COVID-19 pandemic and the transition to hybrid or totally remote learning.

Student access to robust digital tools is key to their success as 21st-century citizens. Yet many students from economically disadvantaged families have limited access to these tools both at school and at home. CoSN has created a toolkit to assist Districts in addressing this issue.
Digital Equity Toolkit

Educators and policymakers are increasingly realizing the potential in using student data to make informed decisions. But even with all that potential, balancing technology advances with the need to protect student privacy and data is a major challenge.
Protecting Privacy Resources

Technology leaders and policymakers need to protect their networks and information security, analyze their current status, and validate what they are doing well.
CoSN Cybersecurity Resources

Instructional Focus & Professional Development

This infographic illustrates a digital transformation. Digital Transformation Infographic

Team Building & Staffing

Stakeholder Focus

Infrastructure

Technology leaders and policymakers need to protect their networks and information security, analyze status, and validate what they are doing well. CoSN Cybersecurity Toolkit

Information and Data Management

K12 education institutions are increasingly looking to digital content and related e-learning technologies to meet evolving education needs and goals. Technology-based products, services, and resources are making positive impacts on K12 learning and are improving efficiency and outcomes in teaching, learning, and classroom/school management. And yet, as educators grow more sophisticated in their use of technology, there are gaps in the integration and interfaces among disparate applications.

Interoperability Standards, Maturity Model, Cost Calculator and Case Studies

Project Unicorn maintains a rubric for mapping student data.

Project Unicorn Rubric

Communications Management

Accessibility is essential for leveraging technology and providing educational opportunities for all students. Digital 508 compliance is a standard that ensures wider access to digital information provided to the public.
Digital Accessibility Toolkit

Business Management

Understanding the complete cost of your computing programs is a key step you must take before you can implement your strategic plan to provide better service for less. Total Cost of Ownership (TCO) is a methodology that allows you to measure and understand the costs of acquiring and maintaining all of your networks, computers, devices, and staff. A TCO assessment helps to set levels for annual budgets, determine the effects of proposed changes in IT staffing or restructuring of operations to migrate to cloud services, or similar.

Total Cost of Ownership Tools

Smart IT Technology Planning & Investment

The CoSN SEND Program recognize that education networks are critical components of schools' infrastructures and provides the following guidance:

- Recognize that 1-to-1 programs are quickly becoming the mainstream and plan accordingly.
- Start network planning and upgrade processes by consulting with teachers and administrators.
- Plan for substantial training and support.
- Understand that accessing content and resources is just as critical outside of the classroom as inside.
- Ensure that rigorous security measures are built into your network designs.
- Make future-focused design choices in terms of scalability and adaptability.

Appendix C - What does a CoSN Peer Review Look Like?

Advanced Preparation - In advance of the site visit, the CoSN team leader will work with a designated contact to collect information, schedule interviews, set up meeting facilities and address initial questions pertinent to the review for analysis. The full team will develop an agenda that maximizes their time onsite.

Fieldwork - A Peer Review team will visit your district to assess your operations.

Days One and Two - The Team will spend the first meeting confirming priorities with the lead sponsor. The remainder of the day, as well as the second day, includes interviewing key leaders within the district.

Day Three - The Peer Review Team will provide a verbal assessment of their recommendations and discuss initial thoughts.

Post Consultancy - A full written report summarizing observations and detailing the team assessment evaluation will then be prepared by the group leader and submitted in draft format within two weeks. The basic outline of the final report is as follows:

1. Purpose of the Peer Review
2. Members of the Review Team
3. Process used to gather information
4. Summary Recommendations
5. Assessments grouped by general categories aligned to the CoSN Digital Leap Success Matrix. These general categories are described in Appendix A.
6. Recommendations by the review team
7. Attachments:
    a. Bios for review team
    b. Agenda for the site visit
    c. List of documents that were reviewed
    d. List of district personnel interviewed