2021 Annual Technology Survey

Results Report

April 5, 2022

Issued by the Vermont Agency of Education

VERMONT
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Introduction

The Annual Technology Survey gathers information about education technology in Vermont supervisory unions/districts (SU/SDs) and schools. The survey is a tool for the Agency of Education (AOE) to collect information on how schools are using technology and the challenges they are facing in providing the infrastructure and equipment needed to equitably and effectively utilize technology to support student-centered learning. The survey also enables the AOE to observe patterns of technology use and infrastructure across SU/SDs and explore opportunities to leverage state investments to support coherence and access across the state. The FY21 survey (2020-2021 academic year) was opened in August 2021 and closed on September 30, 2021. There was 100 percent participation in the survey from Vermont SU/SDs. ***Survey results are reported both by SU/SD and by schools. SU/SD responses represent 54 districts—51 SU/SD and three regional technical center school districts. School responses represent 304 schools—289 public schools and 15 technical and career centers that reported as separate schools.***

The Survey Instrument

This is the fifth year for the annual technology survey. Starting last year, the AOE utilized a new survey platform called Cognito. Cognito enabled the online survey to be better coordinated at the SU/SD level. It is the SU/SD education technology directors and information technology managers that typically administer the network systems and broadband connections and contracts for schools within a district. As such, the survey is directed to these individuals who are also well positioned to oversee the responses from individual schools. School specific inquiries address one-to-one programs, device use within a school, specific school policies and individual school responses to the pandemic. District-wide questions addressed internet service providers, connectivity, network platforms and function, and technology administration issues. A list of survey questions is provided in the appendix section of this report.

AOE would like to thank the education technology directors and other educational staff members and leaders for their work to compile responses to the 2021 survey.

Summary of Key Findings

COVID-19 & Connectivity: Home connectivity remained a priority in the 2020-2021 school year as remote and hybrid learning continued in response to COVID-19. The primary practices implemented by Vermont schools to facilitate home connectivity were distribution of information on low-cost and no-cost internet services -- a practice not commonly in-place before the pandemic; extending Wi-Fi access at the school building; and providing Wi-Fi hotspots. Practices not widely implemented by Vermont schools were Wi-Fi hotspots on school buses and direct financial subsidies for home internet services. In the current school term, and with the return to in-person learning, 27 percent of schools will continue to use Wi-Fi hotspots and 61 percent will maintain a free Wi-Fi signal to the school parking lot.

"The rural nature of our schools makes it almost impossible to provide home access for families. As a result, we will work to make schools our ongoing hub." – Survey Respondent

Broadband Speed Gains: Gains in internet speeds continued within Vermont schools. Seventy-one percent of schools responding to this question now have 1 Gbps or greater upload speeds compared with 67 percent of schools in last year's survey. Download speeds also increased. Schools reporting download speeds of 1 Gbps or greater represented 75 percent of the responses as compared to 69 percent of the responses in the 2020 report. Fiber direct to the site was the principal connection type for schools. As technology use in education continues to grow, having a secure, reliable, and robust internet connection at schools remains of primary importance.

"The pandemic has positively impacted the effective use of technology in our schools. From the acquisition of basic skills to communications and collaboration, all students and teachers have learned how to better use technology." - Survey Respondent

One-to-One Device Availability at 100 Percent: This year, every school reported having one-to-one computing programs. This is the first technology survey to indicate that all schools had such a program in place. One-to-one computing is defined as a program where each student has a computing device dedicated to them over the course of a year, or multiple years, at their school. Seventy-nine percent of schools described their one-to-one program as across the entire building and 18 percent reported a program across multiple grades. Device availability grew significantly. There was a 48 percent increase in the number of available school devices as compared to last year. Schools reported there were 108,471 devices available for school use during the 2020-2021 term. In last year's survey, schools reported 73,290 devices were available for school use. Additional federal funding, coupled with the demands of remote and hybrid learning, likely drove this increase in device acquisition and availability.

"Tech is used in every class, at every level, at least part of every day." - Survey Respondent

Online Learning Provider Programs: Vermont SU/SDs were almost evenly split on whether the use of online learning providers during the pandemic increased the likelihood of using such services in the future. Fifty-four percent of districts indicated they were less likely to utilize online providers, while 46 percent indicated they were more likely to use such providers. Those districts less likely to use online providers cited a return to in-person learning as reducing the need for such services and had questions regarding the effectiveness of this approach as compared to in-person learning. Districts more likely to use online providers in the future credited the experience with online learning due to the pandemic for their interest and for their future exploration of online learning to augment in-person instruction. Twenty-two percent of the SU/SDs reported creating their own virtual academies. It was unclear whether these virtual academies were independently developed or were supported through the VTVLC expansion Collaborative School Option.

"Last year provided us with experience and practice with supporting students in an online learning environment. We recognize the value of online learning as an appropriate flexible pathway for some students and learned a lot about how to maintain rigor and engagement. Not all learning platforms are appropriate for every student and online learning is not a good pathway for every child."
– Survey Respondent

Broadband Connectivity

In considering broadband connectivity progress within Vermont SU/SDs, AOE has found it useful to refer to standards recommended by the State Educational Technology Directors Association (SETDA). In 2019, SETDA updated its methodology and recommendations for broadband targets. SETDA now recommends broadband capacity on a per user basis with peak usage as a statistical measure within larger districts. Peak usage correlated with the broadband capacity at a given service location reflects the quality and speed of that connection when most users may require the connection. If a school district has all students simultaneously using the broadband connection, internet users may experience lag or latency issues.

To help facilitate the discussion that follows on broadband connectivity, this report would clarify the following definitions and concepts. Bandwidth is the capacity of a channel to transmit data. "Bandwidth is traditionally expressed in bits per second (bps). Modern network links now have far greater capacity, which is why bandwidth is now more often expressed as megabits per second (Mbps) or gigabits per second (Gbps). The more bandwidth a data connection has, the more data it can send and receive at one time. In concept, bandwidth can be compared to the volume of water that can flow through a pipe. The wider the pipe's diameter, the more water can flow through it at one time. Bandwidth works on the same principle. The higher the capacity of the communication link, the more data can flow through it per second." (*TechTarget*, "*How does bandwidth work?)* One thousand Mbps equals one Gbps.

In considering future educational needs, SETDA detailed recommended broadband targets in its Broadband Imperatives III report. The following are SETDA's target recommendations to be in place starting with the 2023-2024 school year. All recommendations refer only to download speeds.

- Small Districts – At least 2.8 Mbps per user with a minimum of 300 Mbps per district (less than 1,000 students)
- Medium Districts – At least 2 Mbps per user (1,000 to 10,000 students)
- Large Districts – At least 1.4 Mbps per user (more than 10,000 students)

How do these per-user targets apply to a district's broadband capacity? As an example, for a small district of 500 students to reach the target of 2.8 Mbps per user, the district would need approximately 1.4 Gbps of capacity. For a medium district of 1,000 students, to reach the target of 2 Mbps per user would require a district broadband capacity of approximately 2 Gbps.

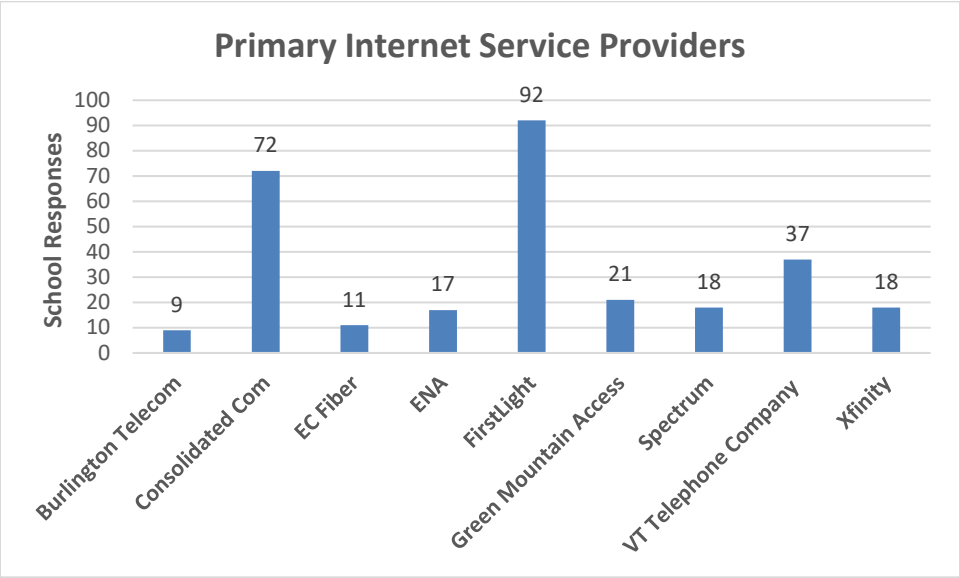
At this time, AOE does not have data on peak usage periods to compare to the download speeds as reported by Vermont SU/SDs. However, we can draw comparisons to the SETDA recommendations by Vermont district sizes. The majority of Vermont's SU/SDs have enrollments that are less than 2,000 students. Approximately 25 percent of SU/SDs have less than a thousand students. The largest school district in Vermont has slightly more than 4,000 students. With the bulk of Vermont's district enrollment numbers at the SETDA medium level, we may observe that our districts are well on their way to meeting the recommended broadband capacity for the 2023-2024 school term. In this year's survey, 29 percent of districts (15 SU/SDs) reported download speeds of 2 Gbps or greater. It is also encouraging to observe the steady growth in both upload and download speeds as reported later in this report. As

Internet Service Providers or ISPs continue to upgrade their networks, it is anticipated that SU/SDs will receive improved service resulting in greater broadband capacity.

The following are survey questions and responses related to broadband connectivity.

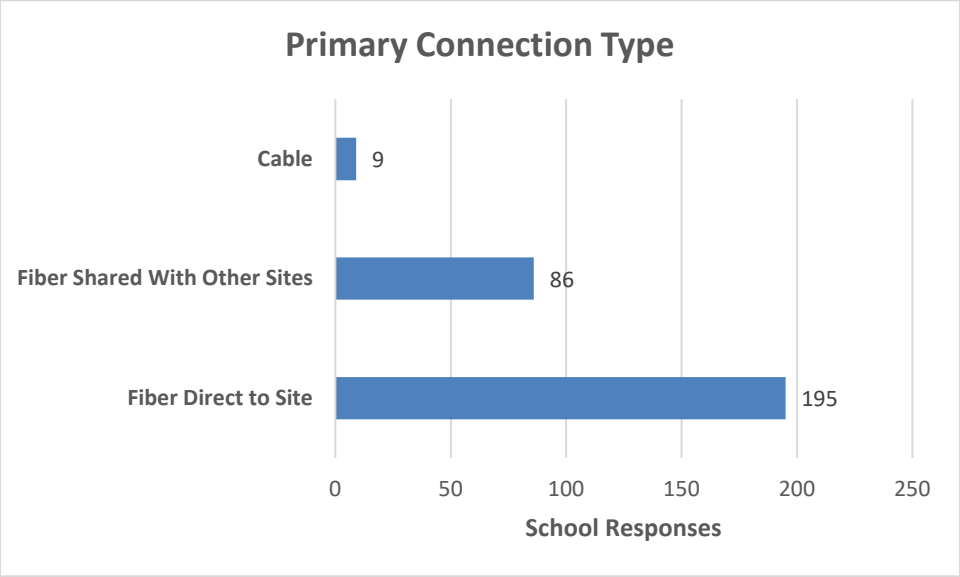
Internet Service & Connection

Who is the primary Internet Service Provider [ISP] for this school?



Consolidated Communications and FirstLight maintained their position as the primary internet service suppliers to schools. Both companies have a statewide presence. No new internet providers were named in this year's survey. The nine providers listed above have remained consistent from last year's report. ISP vendors with less than five responses were not included in this chart. There is more information on home internet access in Vermont on the Public Service Department website, [Public Service Department Interactive Broadband Map](#).

What is the primary connection type for schools in your SU/SD to connect to the Internet?



Fiber remains the primary connection type for schools. However, more SU/SDs reported that schools in their district had a direct fiber connection as opposed to a shared connection. A direct fiber connection serves a single customer and provides the highest level of bandwidth and guaranteed speeds. A shared fiber connection supports multiple destinations and/or customers. During peak use there is more competition for the available bandwidth and having shared fiber may result in degraded connectivity and slower speeds. Typically, the cost for a shared connection is less than a direct fiber connection. This year, AOE asked an additional question on the shared connection to determine whether there was any impact on the quality of the service. As seen in the table below, a shared connection did not significantly impact the quality of service.

If your schools share a connection, which response below describes the quality of the shared connection?

Response Options	School Response
Steady efficient connectivity throughout the schools.	185
During high-use periods connectivity slows.	18
Shared with the district via ELAN.*	10
No response.	91

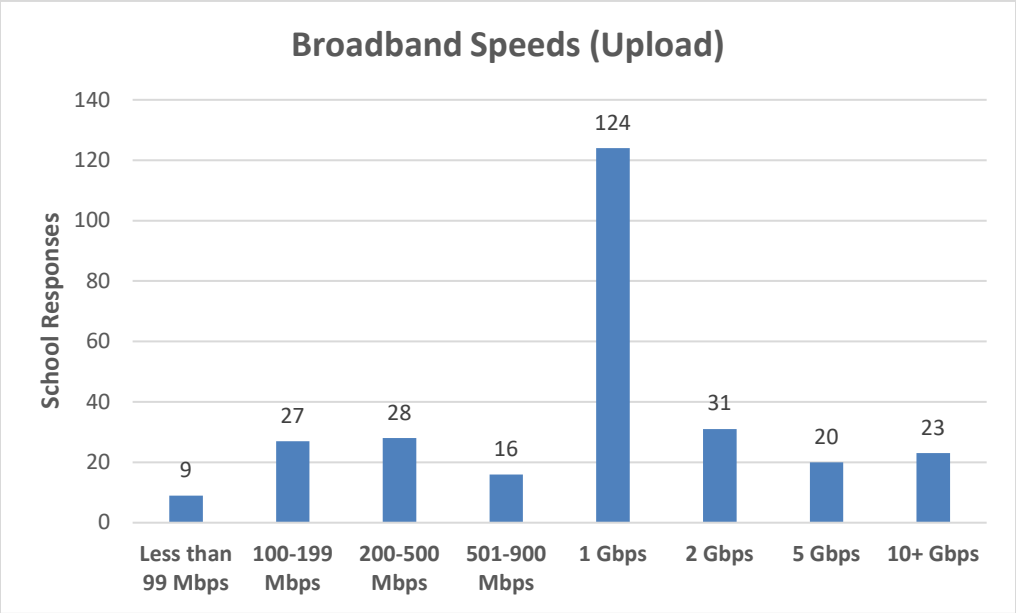
* *ELAN is short for Ethernet local-area network, a piece of IT infrastructure that uses Ethernet cable to connect computers, servers, printers, and other devices that reside within a close geographical area, typically within a single office or building.*

Upload and Download Speeds

In the 2020-2021 school year, Vermont schools continued to rely on video conferencing software as they pivoted from remote learning to hybrid and in-person learning. With the increased reliance on video conferencing software, upload speeds remained an important consideration in evaluating connectivity. When engaging in video conferencing, users are downloading the

video of the person they are talking to and simultaneously uploading live video to the servers. Both the download and upload speeds are important to ensure a good connection and video quality. According to the Federal Communications Commission (FCC), good internet speed should be at or above 25 Mbps. The download speed should be at or above 25 Mbps while the upload speed should not be less than 3 Mbps. Many Internet Service Providers (ISPs) allow different bandwidth limits for downloading and uploading. The upload bandwidth is less than the download bandwidth in many cases as most of the user activities require downloading of data from the internet.

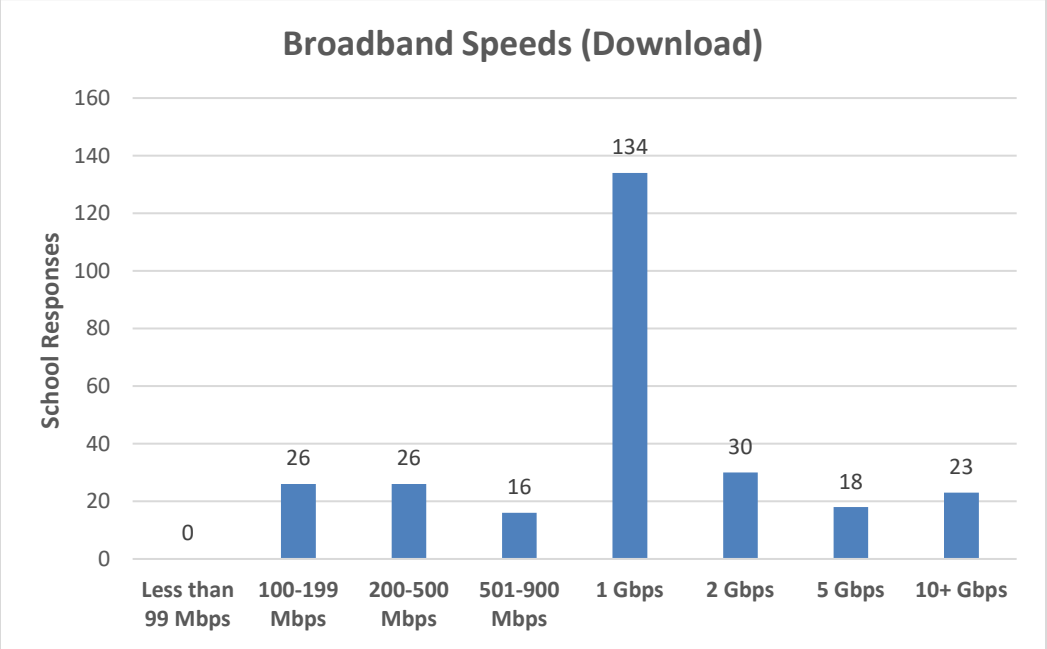
What is the current upload speed for schools in your SU/SD (as advertised by your provider)?



Note: data above is based on 278 schools responding.

In this year's survey, there was an increase in reported upload connectivity speeds. Seventy-one percent of schools responding to this question now have 1 Gbps or greater upload speeds compared with 67 percent of schools in last year's survey. As noted previously in this report, FirstLight and Consolidated Communications have remained the leading providers of internet to Vermont schools. Such increases in speed likely indicates broadband provider upgrades in services. The Vermont Department of Public Service maintains data on broadband high-speed internet availability in the state. To review their data, go to Broadband High-Speed Internet Availability in Vermont | Department of Public Service.

What is the current download speed for schools in your SU/SD (as advertised by your provider)?



Note: data above is based on 273 schools responding.

As with upload speeds, broadband speed gains were similarly noted by schools in the reported download data. In the 2021 survey, responding schools reporting download speeds of 1 Gbps or greater represented 75 percent of the responses as compared to 69 percent of the responses in the 2020 report.

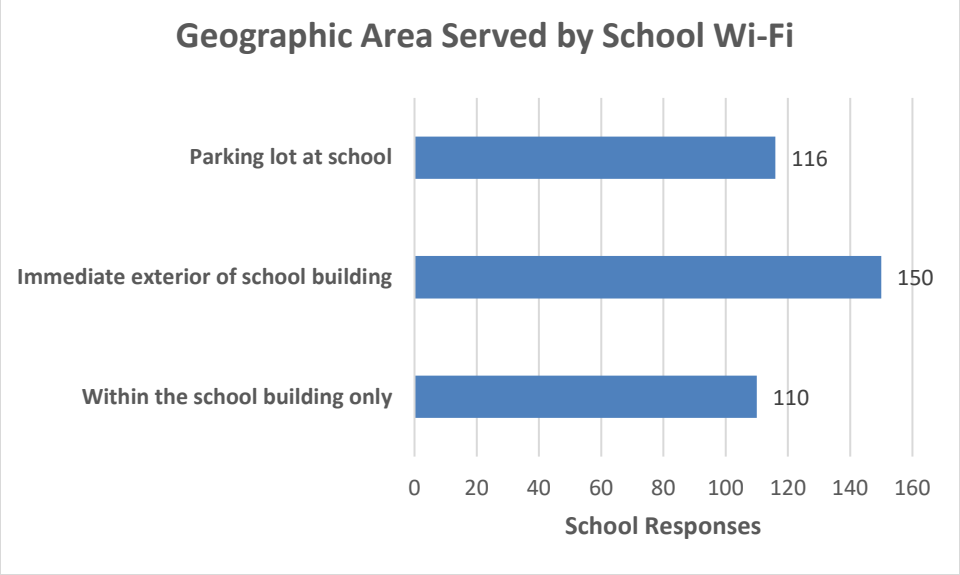
Wi-Fi Access

Wi-Fi access outside of the school building remained important for Vermont schools as the pandemic continued to interrupt in-person learning. Last year's survey documented that the majority of schools, 92 percent, had public Wi-Fi access. This year's survey reflected that more than 90 percent of schools continued to offer such access. The specific answers to the Wi-Fi survey questions are provided below.

Do the schools in your SU/SD provide "guest" or "public" Wi-Fi access?

- 29 schools reported there **was no** public Wi-Fi access provided by the school
- 275 schools reported there **was** public Wi-Fi access provided by the school

If schools in your SU/SD provide "guest" or "public" Wi-Fi, please select the option below that best describes the area served by the Wi-Fi.



Schools providing "guest" or "public" Wi-Fi were asked to indicate where the signal could be detected. Schools could pick more than one response. Among the answers to other locations were school sports fields and guest signal availability allowed only in specific parts of the school building. Compared to last year's survey, fewer schools indicated their guest Wi-Fi was available in the parking lot. This year, 42 percent of schools had public Wi-Fi networks that covered the parking lot compared with 72 percent of schools last year. The change may reflect increased in-school instruction toward the end of last school year and a reinstatement of policies to discourage student browsing outside of the main buildings.

Is there another location in the community to access free Wi-Fi?

- 6 schools indicated there **was no** free Wi-Fi in their community
- 298 schools indicated that there **was other** free Wi-Fi in the community

It should be noted that gains appear to have been made in the availability of free community Wi-Fi. In last year's survey, 22 schools indicated there was no free Wi-Fi in their local area compared to just six schools this year. The pandemic has spurred many state and local organizations to step-up and begin providing more access to free Wi-Fi. It is probable that this change indicates those efforts.

Cell Phone & Broadband Service

AOE surveys schools on the presence and quality of their cell service to ascertain the viability of phones being used as instructional tools or resources. The question of cell phone coverage also gives a sense of the viability of using cell towers as access to the internet for schools and students.

- Students are back in the school's full time.
- Students and parents struggled with using the Canvas platform and the technical support was not always provided in a timely manner. Technical support for these platforms is a challenge for the technical staff. In fall 2020, the rollout of Canvas through VTVLC was delayed and challenging, coinciding with the start of school. Teachers were stressed and struggled to learn a new platform at the same time as planning for in-person school. This resulted in a difficult and negative experience overall. I think the negative could be turned into a positive if a platform was rolled out with lots of planning and PD time for teachers. For example, start trainings towards the end of a school year and offer a teacher academy during the summer, and then roll it out with confidence at the start of a new school year. Prefer in-school learning.
- Need for hands-on learning.
- Many students require more support than can be delivered through online learning.
- Generally, our graded school and most middle school students did not benefit from this type of learning. Better to focus limited resources on one-one online meetings and education.

As you have indicated schools in your SU/SD are more likely to utilize online learning platforms, please explain why.

Most common responses from SU/SDs that were more likely to utilize online providers are below.

- We see the benefit to using this as a "flexible pathway." We are not pursuing this in SY21-22 but will engage in the future in this work.
- We had strong online offerings before COVID, but this has expanded interest and opportunity, so many programs are being added as trials by coaches.
- We currently utilize Google Classroom. It has provided resources that have greatly aided teachers and students.
- We are currently using VTVLC, Virtual High School, and online dual enrollment courses. Each of these options have their own strengths and shortcomings, which in turn make each a good fit for certain students.
- There is still concern that schools will go remote again due to COVID.
- The convenience of online learning; time, place and pace. Increased curricular offerings.
- Teachers are now realizing the value of teaching online.
- Remains a functional option for homeschool students.
- New protocols pertaining to students/staff when feeling unwell are likely to increase the number of missed school days. As a result, we've had some discussions about how online learning tools could augment learning for students who are staying home due to illness or COVID-19 symptoms.
- It would better meet the overall needs of our student population to partner with an IN-State online entity like VTVLC.
- Despite the struggles of many students and families with remote learning during the pandemic, schools observed some students succeeding in online learning where they sometimes had struggled in-person. Also, middle schools at small schools may use VTVLC to expand offerings (e.g., computer science, world languages, etc)

- We've been steadily increasing VTVLC use, and I see it to continue to increase.
- Allow more courses than we can provide with a limited number of teachers and classes per day.

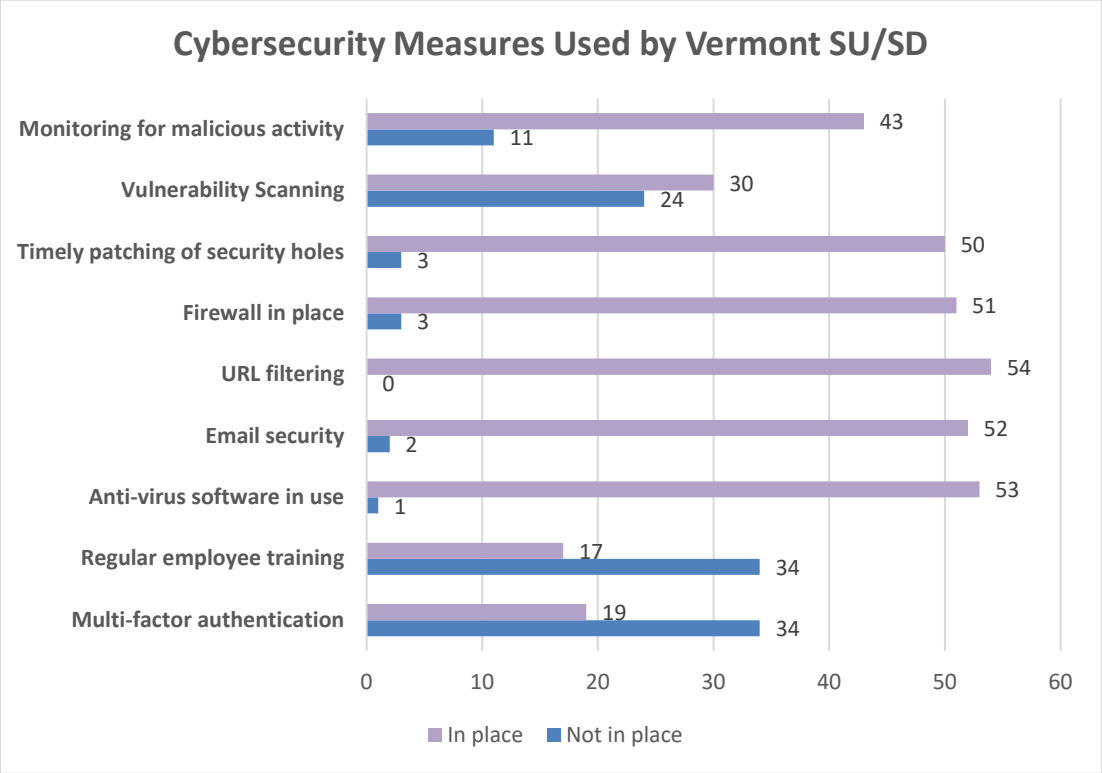
Technology Administration

Questions in this section explore issues and functions that pertain to cybersecurity, student data privacy practices, digital learning plans, and assistive technology.

Cybersecurity

Vermont schools need to prepare for cyber incidents. During calendar year 2020, the K-12 Cyber Incident Map cataloged 408 publicly disclosed school incidents, including student and staff data breaches, ransomware and other malware outbreaks, phishing attacks and other social engineering scams, denial-of-service attacks, and a wide variety of other incidents. This is 18 percent more incidents than were publicly disclosed during the prior calendar year. New this year, AOE queried SU/SD on their cybersecurity posture.

Schools are increasingly the focus for attacks by cyber criminals. Listed below are measures SU/SD can take to improve their cybersecurity posture. Please indicate your SU/SD actions for the following measures. Which actions have your SU/SD implemented to improve your cybersecurity posture?



The cybersecurity measures listed in the graph above are considered industry best practices for creating secure networks. There were 23 SU/SDs that expressed a need for training on security practices for teachers, staff and students. In October 2021, AOE facilitated two one-day trainings on data privacy and cybersecurity. AOE will continue to explore resources and professional learning opportunities for districts in the upcoming year.

What is the greatest need your SU/SD has in the area of cybersecurity? (open-ended)

- Training on security practices for teachers, staff, and students.
- Funding for equipment & applications.
- Funding for IT staff.
- Affordable knowledgeable support.
- Difficult to say – understanding and compliance by staff on safe practices would be a start.
- Not knowing what we don't know; hard to discern opportunistic alarmism from would-be vendors and honest risk assessment/advice.
- Lack of time and inability to be aware of the latest threat.
- Support from school administrators.

Data Privacy

Information that is tied to individual students is referred to as personally identifiable information, or PII, and is subject to federal laws and regulations. New technologies—including personal computers, mobile devices, apps, websites, programs, and online services—are used in classrooms in ways that cause new data to be generated about individual students that never existed before. AOE supports SU/SD implementation of policies and practices that protect PII. The following questions seek to document SU/SD interest and involvement in data privacy protection measures.

Federal laws mandate the protection of student data. In Vermont, AOE supports the Vermont Student Privacy Alliance (VSPA), a collaborative group of SU/SD representatives sharing common concerns around student privacy. Is your SU/SD a member of the VSPA?

- 36 SU/SDs reported their district **was** a member.
- 18 SU/SDs reported their district **was not** a member.

Does your SU/SD request online application vendors sign a student data privacy agreement?

- 25 SU/SDs reported their district **does** request signed data privacy agreements.
- 29 SU/SDs reported their district **does not** request data privacy agreements.

Digital Learning Plans

While digital learning plans are no longer required by the state or other entities, AOE supports the creation of such plans by SU/SD. In the upcoming year, AOE plans to update planning guidance for the development and implementation of digital learning plans. The following questions seek to document the status of such planning among Vermont SU/SD.

A digital learning plan is a guide for how your SU/SD will support digital learning. Digital learning is any instructional practice that effectively uses technology to strengthen a student's learning experience. Does your SU/SD have a digital learning plan in place?

- 20 SU/SDs **have** a digital learning plan in place.
- 34 SU/SDs **do not have** a digital learning plan in place.

If you have a digital learning plan, how often is the plan updated?

Among those SU/SDs that reported having a DLP in place, below is how often those plans are updated.

Every year	3
Every 2-3 years	11
Longer than 3 years	6
Never updated	0

Among those SU/SDs that did not have a plan in place, below are their responses.

No apparent need	5
No staff or time to create one	15
Schools resistant to having SU/SD plan	2
No expertise to create one	2
Don't know	7

How can AOE best support your SU/SD in creating and maintaining a digital learning plan?

- The AOE could supply examples and templates to create a digital learning plan and statewide financial support of ten additional teacher professional learning days.
- We need training on how to create an effective plan that works. We supposedly have a plan but there are no follow-ups to evaluate how it is working.
- We currently have elements of a digital learning plan woven into our other strategic plans. The best way the AOE can support future planning is to support a comprehensive "one plan" planning process that includes tech, curriculum, infrastructure, etc.
- We are working to start a new plan this year. We will reach out for support as needed. (Sample plans would help, especially plans from different sized SU's--we'd all like to see comparable size SU plans to have a reference point.)
- Our digital learning needs shifted significantly during the pandemic. We are currently working on a plan to move forward. We think it is important to incorporate the elements of a digital learning plan in all the other required plans - CIP, Recovery, MTSS, proficiency-based education pedagogy, rather than a separate plan.

Assistive Technology

Assistive technology is a term for creative tools and strategies that help people accomplish tasks at home, school, work, and in the community. AOE works collaboratively with SU/SDs to support children and students with disabilities in their pursuit of a free appropriate education designed to meet their unique needs. The following questions seeks input on measures implemented to provide assistive technology to students.

Does your SU/SD invest in or provide assistive technology to students?

- 48 SU/SDs **invest in** assistive technology.
- 6 SU/SDs **did not** invest in assistive technology.

If your SU/SD invests in assistive technology. How many students in your district are using assistive technology?

Twenty-three SU/SDs indicated that 25 or fewer students were using assistive technology in their district. Seven SU/SDs reported between 26 to 50 students utilized assistive technology. Two districts said between 100 to 200 students used assistive technology. One SU/SD reported more than 200 students were using assistive technology. Eight SU/SDs did not know the number of students utilizing such technology.

Are those students on IEP, 504, EST plans?

Thirty-one SU/SDs reported the students who utilized assistive technology also were participating in an Individualized Education Program (IEP). One district reported the students using assistive technology also were on a 504 plan. Nine SU/SDs did not know whether these students were on an IEP, 504, or EST plans.

Is assistive technology at your SU/SD funded through IDEA initiatives? (Individuals with Disabilities Education Act)

Thirty-two SU/SDs indicated their district used IDEA funds for assistive technology, while 22 SU/SDs said IDEA funding was not used.

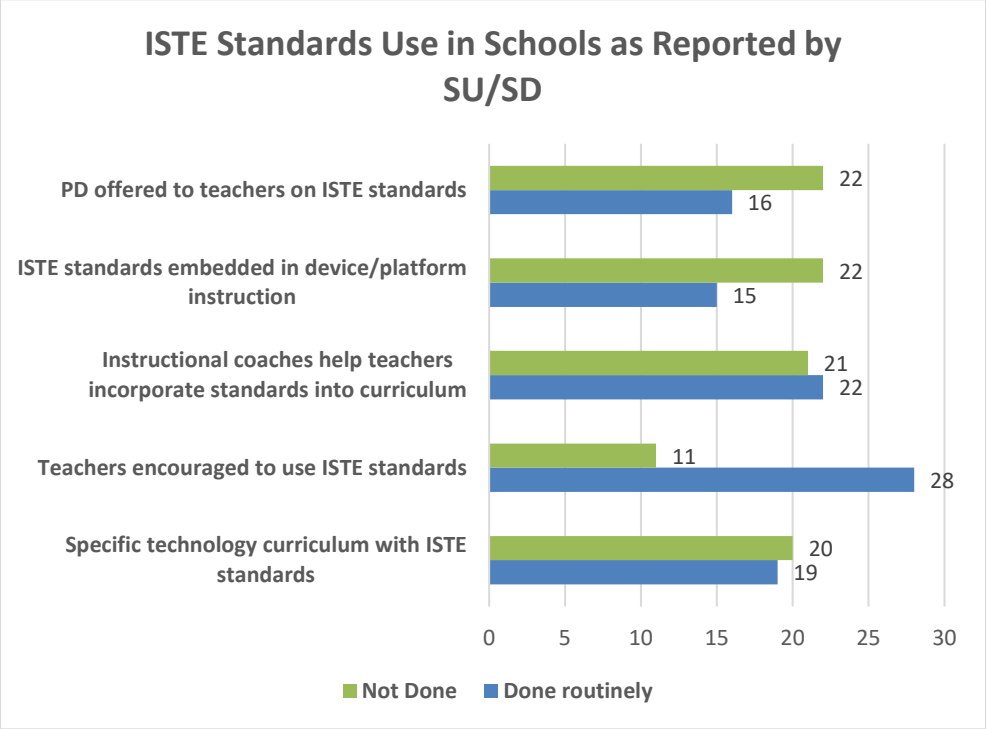
Who in your schools has training to provide assistive technology?

Personnel cited most frequently as receiving training were teachers (28 SU/SDs); paraprofessionals (25 SU/SDs); and external providers (21 SU/SDs). Districts reported a split regarding training for IT personnel with 24 SU/SDs reporting no training and 19 districts providing training. Training in assistive technology was only offered for administrators in eight districts.

Technology Standards

In 2017, the Vermont State Board of Education adopted the International Society for Technology in Education (ISTE) Standards for Student Learning. These standards focus on student-driven processes that empower a student to take an active role in using technology and become a knowledgeable digital citizen, computational thinker and innovative designer, and a creative global communicator and collaborator. The questions in this section examine how schools continue work to embed ISTE standards into curriculum and solicits experiential comments illustrating technology use. ISTE standards may be viewed at ISTE Standards for Students | Agency of Education (vermont.gov).

How are schools in your SU/SD integrating ISTE standards into the curriculum?



How has technology education been leveraged in your SU/SD to teach students how to use technology in meaning ways? (open answer)

This question expands on the previous question to collect examples of how technology is embedded within a school's curriculum. Below is a summary of the responses. Like responses were grouped within a single bulleted response.

- We utilize ISTE standards in our annual curricular work focus on Digital Citizenship. Our Library Media team works to address individual ISTE standards in their integration work and support.
- We offer resources for the use of technology--Google Classroom, robotics, Seesaw for LMS, class streaming, email, and Library Tech Time.
- There is no scope and sequence for these skills. There are pockets of instruction but no organization for this work. We were in the process of working on this prior to the pandemic but we have not been able to pick it back up again.
- The pandemic has positively impacted the effective use of technology in our schools. From the acquisition of basic skills to communications and collaboration, all students and teachers have learned how to better use technology.
- Students have been able to learn on new web-based platforms. They have been taught how to leverage the internet for research and navigate online learning platforms.
- Library Media Specialists present Digital Citizenship Standards and assist classroom teachers with embedding technology into lessons. Additionally, we have two Education Technology Specialists that provide assistance, training, and support to classroom teachers.

- Our STEAM team of teachers and staff work with a group of fifth and sixth graders in a program called "Technology Ambassadors." To become a technology ambassador, students must demonstrate a willingness be a leader in our school community by completing an application and interview process that includes creating a project to showcase their determination. Once accepted into the program, student technology ambassadors work with adults to grow their technology literacy skills and become leaders in the school. Students use these skills to assist other students and also school staff wherever they may need tech help.

What resources do you need to support your education technology program(s)? (open answer)

- We need more technology/instructional coaches. Our one technology integrationist has been repurposed by the previous district administration as more of a STEAM coach. Much of our principal population does not seem to support technology and prioritizes every PD opportunity to ever-changing new initiatives such as Responsive Classroom, Fountas & Pinnell, and so forth.
- We need examples that support deep integrated learning. We need fewer vendors and more focus on the learning.
- While funding is great for a new initiative, we are severely lacking in time to be able to fully explore and use the resources we already have available.
- Post-Covid funding to sustain 1-to-1 device levels, state-level support for cybersecurity, support on crafting district-wide digital learning plans, equal access to high-leverage learning management systems (Canvas), and funding to offer computer science/coding courses/maker spaces in our high poverty/rural district.
- Professional development and funding for additional staffing.
- Micro-credentials for various tech PD in asynchronous modules that earn licensure hours (or better yet, shift licensure to be proficiency based).
- Funding for coaches, maker spaces, software programs, and stipends for teachers to provide additional hours for after school activities such as E-sports coaches or after school programs.
- Administrators and faculty buy-in to make it a priority.
- Additional administrative certification for digital learning leaders.

Computer Science

Computer science is the science that deals with the theory and methods of processing information in digital computers, the design of computer hardware and computing applications. AOE will use the following information to better understand the work and needs of schools to further instruction in this area.

Regarding Computer Science and STEM activities, please indicate what activities the schools in your SU/SD provide?

School Activities in Computer Science & STEM as Reported by SU/SD	Offer	Do Not Offer
After school computer club or related "club"	28	16
Computer club during school	14	28
Extended learning opportunities	33	9
FIRST Lego League Challenge	12	19
Hour of Code activities	46	3
Other coding activities during the course of the year	40	6
Makerspace (in school or community)	42	8
Robotics	42	7
Summer offerings-camps	29	12

All but one SU/SD responded to this question. All other SU/SD indicated the schools in their districts offered at least one computer science and STEM activity to students. Similar to last year's survey, the most popular activities offered within schools were Hour of Code, robotics programs and makerspaces. Hour of Code is promoted annually in December by AOE as part of the nationally observed Computer Science Education Week. Hour of Code is sponsored by the non-profit Code.org organization, whereby educators are encouraged to hold a one-hour coding activity to introduce students to computer science. A makerspace is a collaborative workspace inside a school, library or separate public/private facility for making, learning, exploring and sharing that uses a wide range of technical and non-technical materials for creative projects.

Does your SU/SD offer computer science courses? (yes or no) What grade ranges are computer science courses available?

A majority of SU/SDs indicated schools in their districts offered computer science courses. Fifty-seven percent of SU/SDs reported offering courses and 43 percent indicated their districts did not offer such courses. The most common grade level where students were offered computer science courses was at the high school level. Seventeen districts indicated such courses were available at the secondary level. Two districts indicated computer science courses were only offered at the middle school level and 12 districts reported courses were offered at both the middle and secondary levels. Only one SU/SD indicated they offered computer science courses at the elementary level and that same district indicated such courses were available to students at all grade levels. There were 22 no responses to this question.

As part of this year's technology survey, AOE asked for primary contacts at each SU/SD for computer science curriculum questions. AOE will consider creating a separate survey in the coming year directed at these contacts to better determine the breadth of computer science offerings in Vermont schools and related student participation.

Appendix

AOE utilizes a survey platform called Cognito. Cognito enables the online survey to be coordinated at the SU/SD level. The format of the survey does not lend itself to a simple numerical progression of questions. Rather, depending on the response to certain questions, a respondent would be directed to a different screen to continue the survey. Below are the questions represented within the survey. Not all drop-down options are listed. Where applicable, drop-down options are represented in the main body of this report as the results are reported.

AOE Tech Survey 2021

Please complete by September 30, 2021. This survey gathers information about education technology in supervisory unions/districts and schools for the 2020-2021 school year. The information is a tool AOE uses to determine how technology is supporting student-centered learning. The survey is in five main parts: school specific data; district-wide connectivity information; tech platform functions; tech administration; and survey conclusion. For the school specific data, please add as many schools per supervisory union as you are speaking to.

- Name
- Email
- Phone
- What is your Supervisory Union or District?
- What is your title?
- Are you the primary contact for technology related matters at your SU/SD?

School specific data (Complete this section for All Schools in your SU by clicking "Add School")

- What is the name of your school?
- Which option most accurately describes the one-to-one status in your school?
- Does your one-to-one program allow students to take a device home?
- Does your school have the technology to support your academic programming?
- If you answered no, your school does not have the technology to support your academic programming, please indicate what technology is needed.
- How many total devices are currently available for school use?
- Please provide an estimate percentage (%) by type of devices your school has for student use. (Please note that this question asks for percentages as opposed to whole numbers and the percentages need to add to 100%)
- Does your school currently have a Bring Your Own Device (BYOD) policy?
- If you do not have a BYOD policy, why? Select the answer below that best describes your primary reason for not having one.
- If you do have a BYOD policy, why? Select the answer below that best describes your primary reason for not having one.
- What capabilities are there in your school for in-classroom video/audio?
- In response to COVID-19, what actions did your school take to address home

connectivity issues for students? Listed below are options your school may have utilized. Please indicate by each option whether your school implemented that action. (Provided Wi-Fi hotspots. Provided Wi-Fi hotspots in school buses. Provided financial subsidy for home internet service. Extended Wi-Fi access at the school building.)
- If your school implemented an action not previously listed, please list that action.
- In response to COVID-19, schools implemented new technology and practices to deliver educational services to students. Below is a list of technology options. Please indicate by each option the status of use by your school in the UPCOMING school year. (Wi-Fi hotspots. Free Wi-Fi signal to school parking lot. 1-to-1 student Chromebook/devices for home use. IT help support for home use. School-wide online LMS for remote learning.)
- If your school will continue with a new technology or practice not previously listed, please describe.

District Wide Information: Internet Service Provider, Wi-Fi, Connectivity Information

The remaining questions speak to district wide information.

- Who is the primary Internet Service Provider for this school?
- What is the primary connection type for schools in your SU/SD to connect to the Internet?
- What is the current upload speed for schools in your SU/SD (as advertised by your provider)?
- What is the current download speed for schools in your SU/SD (as advertised by your provider)?
- Is your connection shared?
- How many schools share the connection?
- If your schools share a connection, which response below describes the quality of the shared connection?
- Do the schools in your SU/SD provide "guest" or "public" Wi-Fi access?
- If schools in your SU/SD provide "guest" or "public" Wi-Fi, please select the option below that best describes the area served by the Wi-Fi.
- Is there another location in the community to access free Wi-Fi?
- What is the typical cell phone coverage at the schools in your SU/SD?
- Does your SU/SD or individual schools survey students to determine their home broadband access?
- If yes that you do survey, select the option that best describes how students are surveyed or how you learn about it.
- Do you maintain a list of student home addresses that have no/low broadband?
- If yes that you do survey, what percentage of students in the schools of your SU/SD do not have broadband access at home?

Technology Platforms & Functions

- Approximately what percent (%) of your IT services are currently situated in the cloud?
- What technology platform(s) do the schools in your SU/SD use for an SIS? A Student Information System is a software platform used to manage student data. Listed below

are online platforms previously reported to the AOE as in use within Vermont schools. Please indicate by each platform whether your school is using it as an SIS. If you are not using an SIS indicate that in the next question. (Alpine Achievement, Alma, Canvas, Empower, Infinite Campus, MMS, PowerSchool, Rediker, TylerSIS, Web2School)

- If the schools in your SU/SD use an SIS platform not listed in the previous question, please enter the platform name.
- Would you favor AOE adopting a statewide SIS platform?
- Does your grade book tool platform (SIS) track proficiency graduation requirements?
- What technology platform(s) do the schools in your SU/SD use for an LMS? A Learning Management System is a software application for the delivery of educational courses or learning and development programs. Listed below are online platforms previously reported to the AOE as in use within Vermont schools. Indicate by each platform whether your school is using it as an LMS. (Please note - Google Workspace for Education is NOT an LMS, see upcoming question.) (Alma, Canvas-used by VTVLC, JumpRope, ManageBac, Otus, PowerSchool, Schoology, Seesaw, Toddle, Unified Classroom, Web2School)
- If schools in your SU/SD use a LMS platform not listed in the previous question, please enter the platform name below.
- Google Workspace for Education is a popular application used by many Vermont schools. In last year's survey, schools listed this suite of programs as their primary Learning Management System (LMS). Google describes its applications as tools to be used with a school's LMS and not as an LMS. Please indicate for each application the PRIMARY use of the program by schools in your SU/SD. (In Classroom Only, Student Tool Only, Teacher Tool Only, Schoolwide Use, Other, Don't Know)
- Please share any additional information you would like about your SU/SD use of Google Workspace for Education.
- Have schools in your SU/SD invested in Online Teaching Specialist certification for teachers?
- What technology platform(s) are students in your SU/SD using to develop their Personalized Learning Plans (PLPs)? Listed below are online platforms previously reported to the AOE as in use within Vermont schools. Please indicate by each platform whether your school is using it to manage PLPs. (Alpine Achievement, bulb, Canvas, Dreambox Learning, Google Workspace for Education, Naviance, PowerSchool, SchoolHack/Lift)
- If schools in your SU/SD use a platform for PLPs not listed in the previous question, please enter the platform name below.
- What professional learning or other resources would assist your SU/SD in the area of technology?
- What online learning provider(s) do you use? Listed below are providers previously reported to the AOE as in use by Vermont schools. Please indicate by each option whether schools in your SU/SD utilize that provider. (Brigham Young University Online, Edgenuity, Khan, Oak Meadow, Virtual High School, Vermont Virtual Learning Cooperative (VTVLC), SU/SD created virtual academy)
- If you use an online provider not listed in the previous question, please list it here.
- As a result of COVID-19 and the increased experience schools had with online learning,

will schools in your SU/SD be more likely or less likely to utilize online learning providers such as VTVLC?
- As you have indicated schools in your SU/SD are more likely to utilize online learning platforms, please explain why.
- As you have indicated schools in your SU/SD are less likely to utilize online learning platforms, please explain why.

Technology Administration

Cybersecurity

- Schools are increasingly the focus for attacks by cyber criminals. Listed below are measures SU/SD can take to improve their cybersecurity posture. Please indicate your SU/SD actions for the following measures. (Network monitoring to detect malicious activity. Network vulnerability scanning. Timely patching of security holes. Application firewall in place. URL filtering. Email security. Anti-virus software in use. Regular employee training. Multi-factor password authentication.)
- What is the greatest need your SU/SD has in the area of cybersecurity?

Data Privacy

- Federal laws mandate the protection of student data. In Vermont, AOE supports the Vermont Student Privacy Alliance (VSPA), a collaborative group of SU/SD representatives sharing common concerns around student privacy. Is your SU/SD a member of the VSPA?
- Does your SU/SD request online application vendors to sign a student data privacy agreement?

Digital Learning Plans

- A digital learning plan is a guide for how your SU/SD will support digital learning. Digital learning is any instructional practice that effectively uses technology to strengthen a student's learning experience. Does your SU/SD have a digital learning plan in place?
- If you have a digital learning plan, how often is the plan updated?
- If your SU/SD does not have a plan, please select the reason that BEST represents why you do not have one.
- How can AOE best support your SU/SD in creating and maintaining a digital learning plan?

Assistive Technology

- Does the SU/SD invest in or provide assistive technology to students?

- If yes, how many students in your SU/SD are using assistive technology?
- Are those students on IEP, 504, EST Plans?
- Is assistive technology funded through IDEA initiatives? (Individuals with Disabilities Education Act)
- Who in your schools have training to provide assistive technology? (Administrators, IT Personnel, Paraprofessionals, Teachers, External providers--e.g. DAIL)

Technology Standards & Computer Science

In 2017, the Vermont State Board of Education adopted the International Standards for Technology Education. These standards outline what Vermont students should know and be able to do with respect to information technology and will guide and inform the work of schools as they prepare students for college and careers that have been dramatically transformed by information technology.

- How are the schools in your SU/SD integrating ISTE standards into the curriculum? Below are options. Please indicate for each option whether it is something your schools are commonly doing. (Schools have a specific technology curriculum with ISTE standards. Teachers encouraged to incorporate ISTE standards into class curriculum. Instructional coaches help teachers incorporate ISTE standards into their lessons. ISTE standards are embedded in the instruction on new devices & platform uses. Schools offer teachers professional development on ISTE standards.)
- How has technology education been leveraged in your SU/SD to teach students how to use technology in meaningful ways?
- What resources do you need to support your education technology program?
- Regarding Computer Science and STEM activities, please indicate what activities the schools in your SU/SD provide. (After school computer club or related "club." Computer club during school. Extended learning opportunities. FIRST Lego League Challenge. Hour of Code activities. Other coding activities during the course of the year. Makerspace-in school or community. Robotics. Summer offerings-camp.)
- Does your SU/SD offer computer science courses?
- What grade ranges are computer science courses available?
- Who is the primary contact for computer science curriculum in your SU/SD?