

# Beyond the classroom today:

From Increasing Technology  
Access to Improving Student  
Learning Experiences




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A photograph of a male teacher with a beard, wearing a light blue button-down shirt, leaning over a desk to assist a group of young students. The students are looking down at something on the desk. In the background, a large map of the United States is visible on the wall. The image has a soft, warm color palette with a pinkish-purple overlay at the bottom.

**“ I can surely say from my personal experience that ‘traditional schools’ definitely don’t work for the majority of students, including me. And although they are working to improve their teaching methods and the class/school environment and modernizing it, most of the administrators and teachers still have that old traditional mentality and aren’t willing to change to a more modern, easier, and understandable way of teaching so that students may learn easier and quicker. My school is improving technologically-wise. But the teaching methods are not. Class time is very slow, and it is hard to understand what the teacher is teaching at times. And although some teachers are open-minded with new teaching methods to help students, most teachers need to understand that not all students learn the same way and as fast as others.”**

*Grade 10 student, El Paso, Texas*

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## Introduction

**T**he long-tail impact of the Covid-19 pandemic continues in K-12 education, both providing rich lessons learned from the experience for both educators and parents and continuing to stimulate new energy around how to improve educational experiences for all students. The jump start for this newfound interest was certainly the seismic jolt to the traditional school paradigm resulting from the shift to virtual learning in most schools and communities due to the pandemic. The immediate effects of that virtual learning shift have been well documented. To support continuity of learning when students could not come into physical school buildings, students were provided with personally assigned tablets, laptops, and Chromebook™ notebook computers\* to use from home to log in to virtual classes, to access online learning materials, and to facilitate communications with teachers and classmates. This necessity-based innovation has resulted in a significant change in student access to technology in school.

**Per recent Speak Up® Research findings, 91% of K-12 teachers now report that their students have access to a personally assigned digital learning device to use within the classroom, a threefold increase since 2014.** School districts gained new insights into the home Internet connectivity challenges in their community and doubled down on providing ways for students to gain access to the Internet through mobile hotspots, WiFi in school parking lots, and partnering with local businesses and libraries as access points. As a result of the virtual learning experience, teachers developed new skills using technology not just to engage students in learning but as a learning platform. **Most notably, 50% of classroom teachers now say that they are very comfortable leveraging student devices within their lessons or classroom activities; less than half as many teachers (22%) said the same in 2018.** And parents acquired a more in-depth awareness about their child's education and school-based learning life from that kitchen table view of school. They enjoyed that transparency about their child's education

and the increased communication with teachers and would like those side benefits of virtual learning to continue. Though certainly not new, administrators more fully realized that the role of the community school far extends beyond providing classroom instruction and includes a critical mission of childcare and providing emotional and mental health support for children.

As a result of these seismic changes in K-12 education, the classroom looks very different today. As noted by the 10th grade student in the quote above, schools certainly have been "improving technologically." The Speak Up Research findings in this new report further document that reality. But the work of transforming education is still in its infancy, despite the physical changes to the classroom such as more devices for students to use and a greater emphasis on teacher use of digital content in the classroom. The new challenge today is to move from simply providing increased technology access to improving student learning experiences for all. A key lesson learned from the past few years is that the mere presence of technology does not magically translate into deeper learning experiences. But one of the obstacles to strategically planning for more effective use of greater access to technology has been a nostalgic pull in some communities to revert to the way schools traditionally looked and functioned in February 2020.



\*Google Chromebook is a trademark of Google LLC.

Given the changes in K-12 education, reverting to school models of the past is neither realistic nor even possible today. Just as banks, grocery stores, and medical providers are leaning into the new behaviors and preferences of their consumers, so must our schools (see “Context from other sectors”). As we start to put the pandemic in the rear-view window, educators are increasingly coming to that same belief. **According to 89% of district administrators in the Speak Up Research surveys from the 2021-22 school year, the pandemic and the resulting disruptions to traditional education have significantly and sustainably changed K-12 education.** Whether it was the intent or not, the steps undertaken to support continuity of learning have left an indelible mark on the ways teachers teach, parents engage, administrators lead, and students learn. As this report reveals, there is no going back, but the path forward to creating new teaching and learning mindsets is still a work in progress.

In this third report from Project Tomorrow® and Spectrum Enterprise® in our special series focused on the role of technology in education today, we examine evidence about how the long-tail impact of the pandemic and the resulting shifts to more technology-based instruction have forever changed our schools and our classrooms — and why there is no going back despite the nostalgia for the past or the uncertainty about the future. Leveraging the most recent Speak Up Research findings as well as longitudinal data from 2014 to present, this new report documents how technology access and usage have changed significantly in the past few years and how that increased access has resulted in changes in teachers’ mindsets, valuations, and attitudes about the most effective use cases for classroom-based digital learning. Using this new reality as a springboard to the future, we discuss the aspirations of K-12 students, teachers, school principals, and parents for a new type of classroom where technology is utilized appropriately and effectively to support deeper, active learning for all students. In this new visionary learning environment, the classroom experience is more interactive, participatory, and personalized to ensure that every student is well prepared for success in today’s highly information-dependent society and economy. And that is a goal that all K-12 stakeholders can endorse.

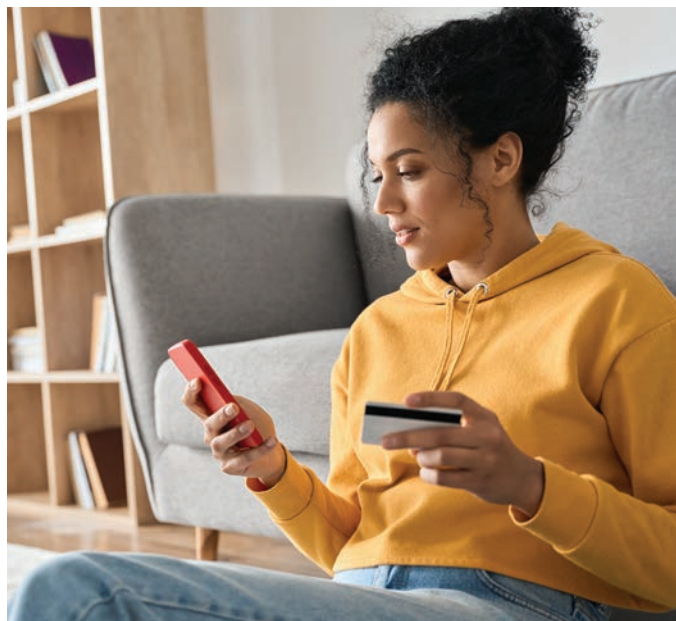


## Key Findings

- K-12 students have more access to technology than ever before, and teachers are reporting heightened usage of digital content and resources within their everyday instruction.
- Teachers’ skills implementing new learning models in the classroom, especially those that support more personalized learning experiences for students, are significantly more sophisticated than they were before the pandemic.
- Teachers have a different perspective today on what they need in order to use technology more effectively in their classroom, and that new positioning includes more support from their school or district. Students agree.
- Students, teachers, principals, and parents have a clearer vision today about the types of technologies that can support more effective classroom instruction and enhanced learning outcomes for students. Central to that vision, however, is the need for classroom Internet connectivity that is consistent and reliable to support digitally infused instruction.

## Context from other sectors

In response to the pandemic, many aspects of our social, economic, and professional lives changed overnight. From wearing masks on airplanes to working remotely from home to buying groceries online and having our pharmacy prescriptions delivered, things that seemed the prerogative of a few became more commonplace and, in many cases, were adopted by the majority as new behaviors. Today, while health and safety requirements that were in place during the first 18 months of the pandemic have been relaxed, many of these new practices adopted during the height of the global health crisis have become more widely accepted as a new normal. And it appears that many of these new behaviors or ways of doing business are here to stay. The reason: people like the convenience, the flexibility, and the effectiveness of these innovations.



- According to a McKinsey & Company study, 58% of employees in their national sampling say that they now have a work-from-home option (either full time or part time) provided to them by their employer.<sup>i</sup>
- 54.3% of Americans have purchased groceries online within the past 12 months, a significant increase from 2019, when only one-third (36.9%) were online grocery shoppers.<sup>ii</sup>
- The World Bank, which tracks financial inclusion around the world, reports that more people are making online payments. Per their research, two-thirds of adults worldwide now make or receive a digital payment. In developed economies like the United States, online payment processing grew from 35% in 2014 to 57% in 2021.<sup>iii</sup>
- Per a recently published new RAND Corporation study published in Health Affairs (November 2022), Americans are more willing to consult with a doctor via a telehealth appointment today than prior to the pandemic. This is especially true for Black Americans and people with less than a high school education. For example, in February 2019, 42% of Black Americans said they would consider a video telehealth appointment with a medical professional; in March 2021, that percentage had climbed to 67%.<sup>iv</sup> Notably, 85% of doctors say that telehealth appointments increase their ability to provide greater timeliness of care with better-quality results for their patients.<sup>v</sup>
- The Pew Internet and American Life Project reports that 40% of Americans now say that digital tools have taken on a new relevance in their personal lives as well, especially relative to doing commonplace things differently, such as connecting with family and friends through video calls or text messages. Additionally, 29% of broadband users say they have improved the speed, reliability, or quality of their high-speed Internet connection at home since the beginning of the outbreak to accommodate the increased value they place on using these digital tools.<sup>vi</sup>



For the past 19 years, Project Tomorrow, a national education nonprofit organization, has been investigating the role of digital tools, content, and resources within schools and classrooms through the Speak Up Research Project. Since 2003, over 6.2 million K-12 students, parents, teachers, and administrators have shared their firsthand perspectives and ideas on the role of technology in education. Reflecting the priorities and concerns of school and district leaders, the research has also focused on the challenges associated with technology usage, including how to fund the necessary investments in infrastructure and tools.

Project Tomorrow, in collaboration with Spectrum Enterprise, has leveraged the most recent Speak Up Research findings to provide new insights for educators, policymakers, and community leaders about key education issues. The first report in this series, ***Beyond the Homework Gap: Leveraging Technology to Support Equity of Learning Experiences In School***,<sup>vii</sup> provides a comprehensive review of how school districts are now addressing the quality of school connectivity to support more effective in-school learning. The second report, ***Beyond the IT Department: The Emergence of the CIO as a Digital Leader in K-12 Districts***,<sup>vii</sup> examines the changing role of the K-12 district technology leader in supporting more effective uses of digital tools and resources to support student and teacher outcomes.

## Finding #1

**K-12 students have more access to technology than ever before, and teachers are reporting heightened usage of digital content and resources within their everyday instruction.**

**S**chool and district leaders have long talked about the value of students having individualized and dependable access to digital learning devices (tablets, laptops, and/or Chromebooks) to support desired achievement outcomes. The financial investment to make that happen for all students was a significant obstacle prior to the pandemic, however. Consequently, districts had to prioritize certain schools or grades for their 1:1 program implementation. The necessity of providing continuity of learning when students were at home and the unprecedented financial resources provided by federal and state pandemic funds accelerated the timeline in many communities for providing all students with a tablet, laptop, or Chromebook.

**In 2018, 39% of teachers reported that either their students did not have access to any digital learning devices to use in class or the access was only provided when the teacher could schedule use of a laptop or tablet cart of devices for a particular lesson or class activity. Only 9% of teachers say that this is the case in their class today.** In most classrooms around the country, students are using school-owned devices that are personally assigned to them. A smaller set of students are bringing their own personal devices from home to support classroom instruction; what many refer to as a Bring Your

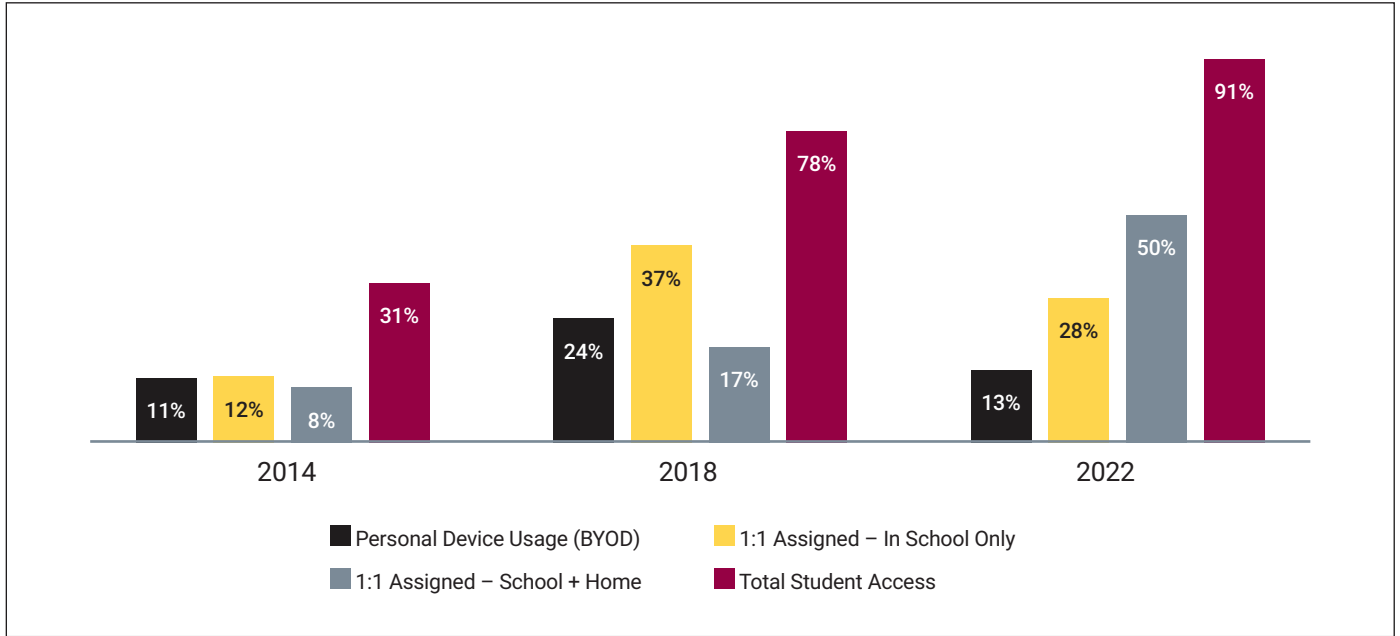


Own Device (BYOD) program. Whereas in 2014 only 3 in 10 (31% of teachers) said their students had individualized access to a device, that number has nearly tripled in the past eight years to 91% (Chart A). This makes sense given that both teachers and students are now relying more on digital content and resources as part of daily classroom activities. The use cases explored during virtual learning have carried over now to the physical classroom. Shared access or scheduled carts simply do not work in this new classroom environment.

Additionally, education leaders gained a new perspective during the pandemic on the value of students using a personally assigned tablet, laptop, or Chromebook at home to support learning. While not all at-home learning



**Chart A: Students' personal access to digital learning devices: longitudinal view from 2014, 2018, and 2022**



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during the pandemic was optimal, the experience has opened the eyes of many educators to the benefits of erasing the traditional boundaries of home and school when it comes to student learning. Assigning students devices that they can also use at home provides a new frontier for extended learning. This also represents a dramatic shift in district policies and procedures since many districts, even with implemented 1:1 programs, were often reluctant to have students take those devices home.

The ability to bring their devices home is still mostly the privilege of older students (Table 1). **Nearly two-thirds of students in grades 6-12 can now take home their school-owned device to use for homework, to support school project assignments, or to have continued communication with their teacher after school hours. Comparatively, in 2018, only one-quarter of high school students had the ability to bring their devices home to support extended learning.**

**Table 1: Teacher reporting on student access to digital learning devices by grade level (2021-22 findings)**

Type of 1:1 Access	% of teachers by grade level assignment - the types of 1:1 device access provided to their students			
	Kindergarten-Grade 2	Grades 3-5	Grades 6-8	Grades 9-12
Students are using their own personal devices (BYOD) in school	9%	11%	11%	17%
Students are assigned a school-owned device – usage is in school only	53%	45%	19%	11%
Students are assigned a school-owned device – usage is both in school and at home	28%	40%	64%	65%

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As noted earlier, both students and teachers are using more digital content and resources today than prior to the pandemic. Teachers became more familiar with many online tools during the pandemic and continue to leverage those solutions now in their physical classrooms. For example, **70% of classroom teachers now report using an online curriculum at least weekly as part of instruction with students** (Table 2). In 2014, only 34% of teachers were reporting that same level of usage. Also noteworthy is the increased usage of online reading sites

and subscriptions. This use case is most likely the result of every student now having an Internet-connected device they can use to access a reading site. **Overall, 53% of K-12 teachers report weekly usage of reading sites, whereas in 2014, only 14% of teachers said their classroom had a book or reading site subscription.** Representing a significant change in instructional practices, 54% of teachers in kindergarten through grade 5 classrooms say reading sites are used daily in their classroom today.

**Table 2: Teacher reporting on digital content used weekly in their classroom (2021-22 findings)**

<b>Type of digital content being used in classrooms</b>	<b>% of teachers who report weekly usage of these resources</b>
Online curriculum	70%
Online videos	63%
Software and apps to support student skill development	54%
Online reading sites and subscriptions	53%
Online games	51%
Online databases for research and writing	44%
Virtual whiteboards	33%

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With the above reported increases in both student access to devices and the use of digital content in the classroom, many educators, thought leaders, and policymakers are now exploring what constitutes effective and/or appropriate use of technology in a post-pandemic classroom. A key question is whether technology is being used to support passive or active learning in our classrooms. Per the Speak Up Research findings, students report that the primary way that they use technology in class today is taking online tests or quizzes (84% of students in grades 6-12), an increase of 58% in the past two years. While we might assume that teachers are using more online formative assessments to inform modifications to instructional practices or to support

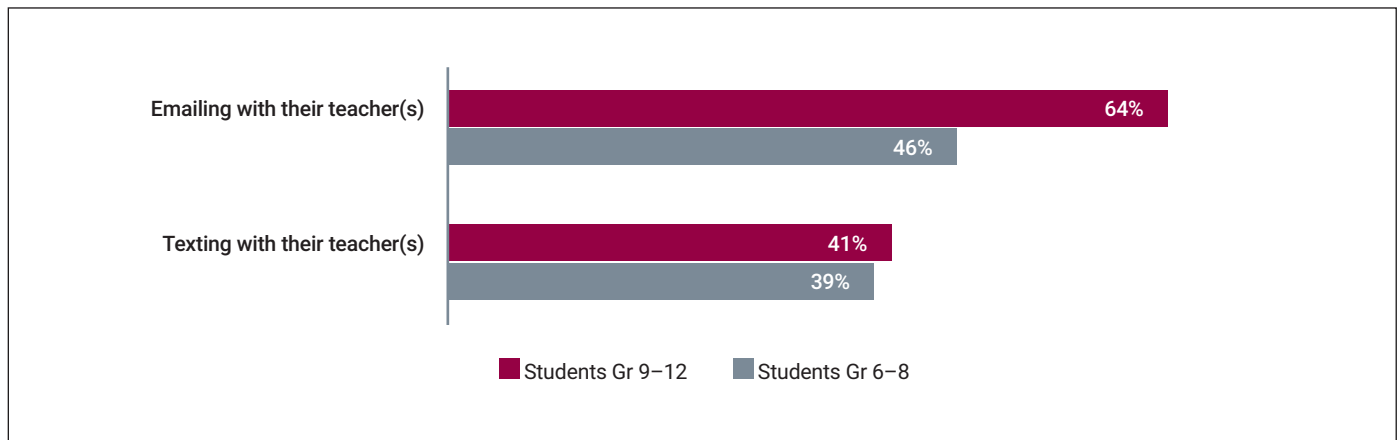
differentiated instruction in the classroom, the bottom line is that the online tests or quizzes are more in service of educator needs than enabling active learning by students.

However, an additional benefit of the increased student access to technology and teachers' changed mindset about the value of digital tools is the increase, as reported by students, in more regular online communication with their teacher(s). Educational research has long touted the benefits of student-teacher relationship development as a key to increasing student engagement in learning and, subsequently, learning outcomes. It is noteworthy, therefore, that students say they are engaging in regular email and text communication with their teachers, thus

supporting that relationship development as well as providing students with just-in-time answers to questions and support in their learning process. Based on the 2021-22 Speak Up findings, 64% of high school students and 46% of middle school students say they regularly email questions to their teachers; approximately 40% of students in grades 6-12 are using text messaging apps for the same purpose (Chart B). One-quarter of students in grades 3-5 also report regularly emailing questions to their teachers.



**Chart B: Email and text communication with their teachers – as reported by grade 6–12 students**

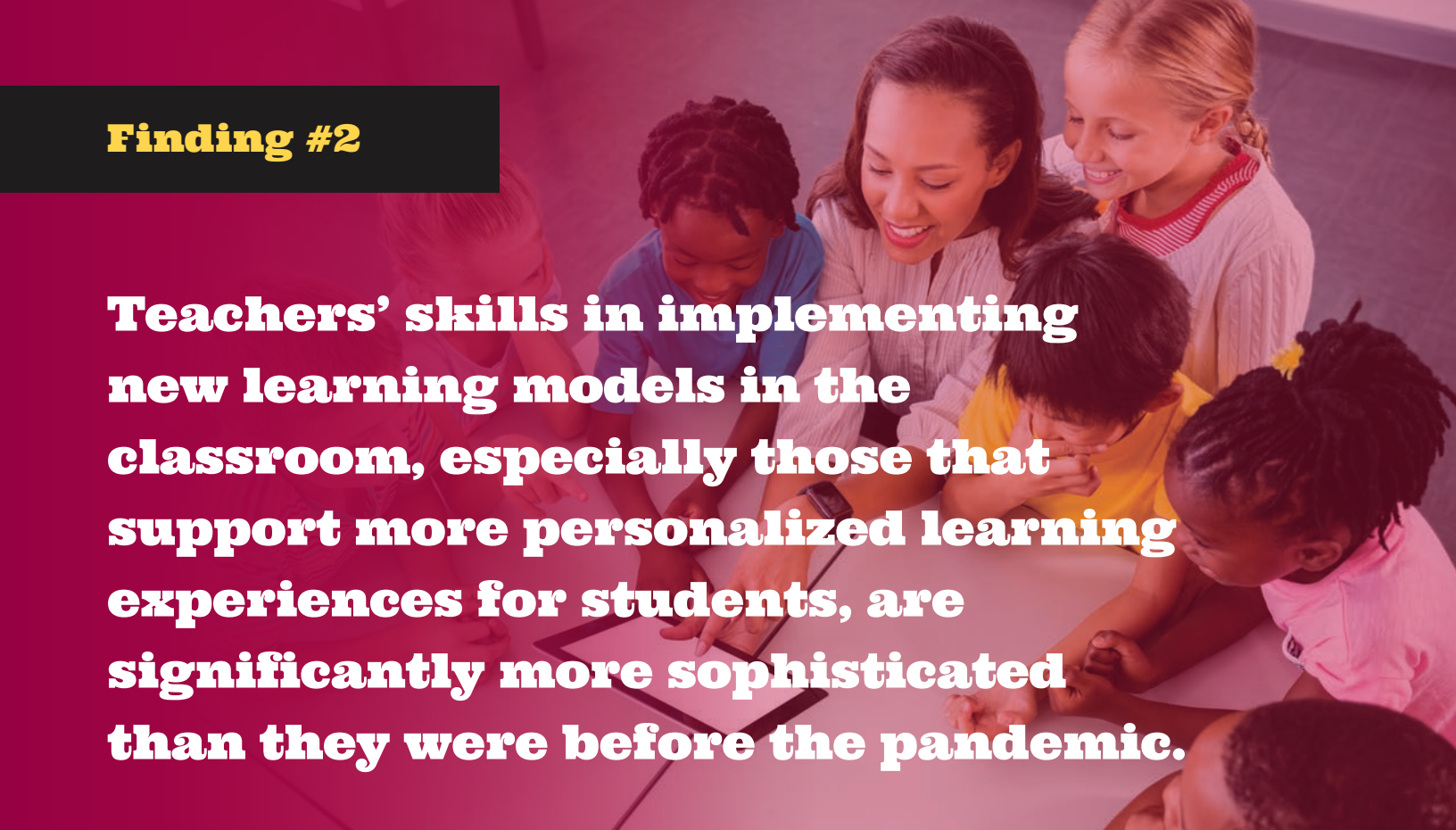


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This emergence of a reliance on digital student-teacher communication is another by-product of the virtual learning environment from the pandemic. In 2014, 74% of teachers reported that a primary technology-enhanced task of their professional work was updating and maintaining a class or school portal for communication with students and parents. While these tools are still part of many school environments, students are increasingly

interested in having two-way communication with their teachers, mirroring how most communication is facilitated today using mobile devices. To create a more optimal learning experience, 55% of students in grades 6–12 now say that having regular, interactive communication with their teacher(s) using online tools is a new requirement in their learning lives.

## Finding #2



**Teachers' skills in implementing new learning models in the classroom, especially those that support more personalized learning experiences for students, are significantly more sophisticated than they were before the pandemic.**

**T**eachers are reporting higher levels of comfort in their own abilities to leverage technology to support a variety of new classroom models and learning strategies today compared with the pre-pandemic era. Through their adoption of new technologies in the classroom over the past few years, teachers are tapping into more sophisticated tools and using those tools to support student learning more directly and not just to automate or organize their professional tasks. In 2014, teachers reported their top uses of technology in the classroom were creating slide shows or presentations to be used in direct instruction (65%) and updating school portals with grades, homework assignments, and project information (74%). As with the acceleration of 1:1 student device programs in schools, districts also fast-tracked their migration to Google for Education™ productivity applications\*\* and Microsoft 365 Education productivity applications\*\*\* and a variety of learning management systems, to support virtual learning during the pandemic. Per recent Speak Up Research, 72% of districts

now report widespread adoption of Google tools within instruction, and 36% say the same about Microsoft tools. The widespread nature of these adoptions jump-started more interactive usage of technology in the classroom by both teachers and students, moving technology beyond the role of simply a passive repository of information.

**It is not surprising, therefore, that 50% of classroom teachers now report that they are very comfortable leveraging tablets, laptops, and Chromebooks within instruction (Table 3). This represents a significant increase since 2018, when only 22% of teachers felt the same about their skills with mobile learning.** Longstanding research from Project Tomorrow documents the impact of 1:1 programs on teacher technology skill development and heightened valuation of digital learning. Teachers are also more comfortable today with using technology to support personalized learning (38%), supporting student choices within the learning process (35%), facilitating student collaborations (35%), and differentiating instruction (31%) than compared with 2018.

\*\*Google for Education is a trademark of Google LLC.

\*\*\*Microsoft 365 Education is a trademark of Microsoft Corporation.

**Table 3: Teachers' comfort using technology to support new learning models and strategies**

<b>New classroom models and strategies</b>	<b>% of teachers who report feeling very comfortable with using technology to support these models and strategies</b>	
	2018	2022
Taking advantage of students' 1:1 access to a mobile device in my lessons	22%	50%
Personalizing learning within my classroom for each student	23%	38%
Allowing students to have choices about how they want to learn	21%	35%
Facilitating student collaborations using digital tools	21%	35%
Differentiating instruction	23%	31%

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Teachers' own assessment of their abilities to use technology in new ways to support student learning is only the tip of the iceberg, however, in terms of the changes in the classroom environment today. Increased confidence by some teachers has led to more innovation and experimentation in the classroom around technology usage with their students. But more work is needed to help the majority of teachers gain this same elevated comfort and confidence in their abilities to use technology to support student outcomes such as noted above. Below the surface of the actual practices is the value that teachers place on effective use of technology in the classroom. Speak Up reports have long documented a relationship between teachers' perceptions of the value of digital learning and their willingness to use technology to support student learning. Thus, the evolution of teachers' perceptions of the outcomes associated with their own technology use in their classroom from 2014 to 2022 is important to note.

In 2014, only 21% of teachers said that using technology in their classroom allowed them to better meet the needs of every student through the personalization



of the learning process. Technology has long held the promise of enabling greater learning personalization, but it often has been elusive at the classroom level. In 2018, 45% of teachers believed that they were better able to

personalize instruction for their students because of the effective use of technology. Increased classroom access to technology and enhanced Internet connectivity have helped teachers realize this benefit for themselves. **Per the most recent Speak Up findings, 6 in 10 teachers now say that the ability to personalize instruction for every one of their students is true for them in their classroom today** (Table 4). Additionally, 59% of teachers now report that they are creating more interactive and relevant lessons for students, and 56% say that with the digital tools and resources at their disposal, they are enabling their students to be more self-directed in their learning.



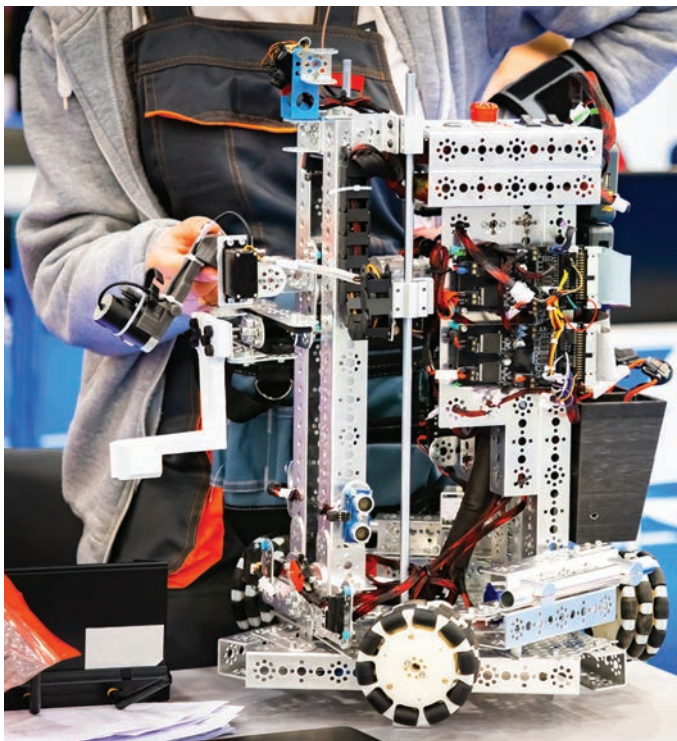
**Table 4: Teacher outcomes from the effective use of technology in the classroom: a longitudinal view from 2014, 2018, and 2022**

<b>Teacher outcomes from the effective use of technology in the classroom</b>	<b>% of teachers who report these outcomes</b>		
	2014	2018	2022
Better able to personalize instruction for my students	21%	45%	60%
Creating more interactive and relevant lessons and classroom activities	43%	43%	59%
Better organized in my classroom processes	45%	50%	59%
Encouraging more student self-directed learning	36%	39%	56%
Facilitating more student-centered learning experiences	38%	39%	45%

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Just as the teacher outcomes have evolved because of the combination of the pandemic’s virtual learning experiments and the augmented technology access in the classroom, so have the teachers’ perceptions of the impact of digital learning on their students. Prior to the pandemic, educators generally identified a singular benefit associated with student technology use in the classroom: increased student engagement. In 2014 and 2018, 51% of teachers identified increased student engagement as the primary

outcome from classroom technology usage. Similarly, 65% of principals held that same belief. And 69% of school districts administrators looked to student engagement as the primary metric for evaluating the efficacy of a digital resource in the classroom. Student engagement in the learning process is certainly important. However, when thinking about technology usage, student outcomes should not be the only purpose or reason for ensuring efficacy in digital learning experiences.



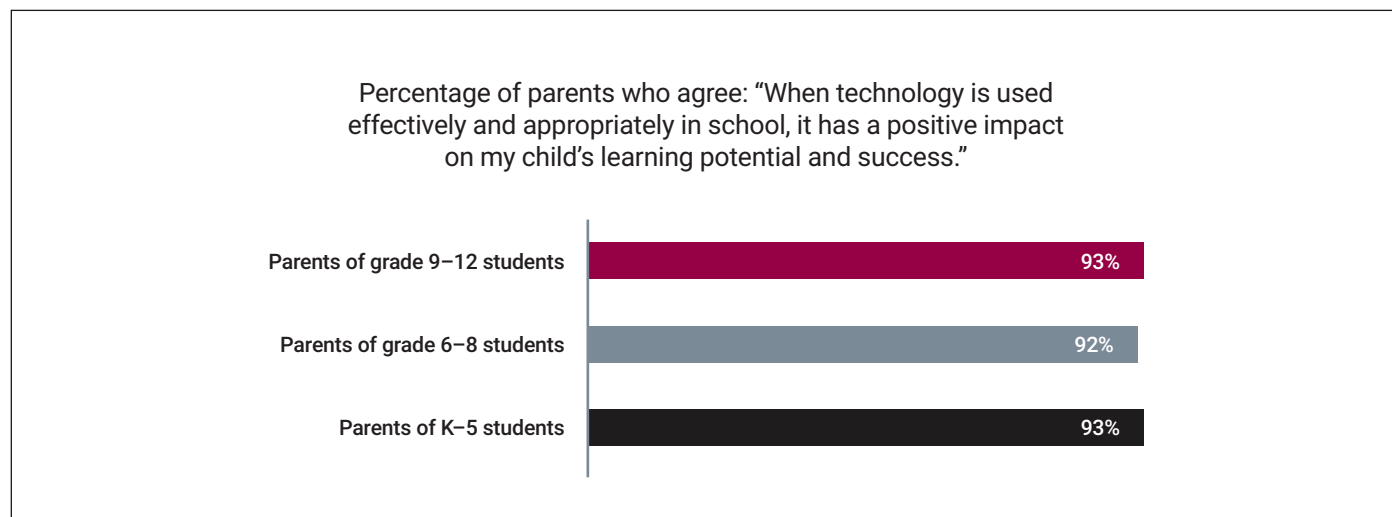
Today, teachers are thinking beyond student engagement as the only or the most significant outcome from technology use in their classroom. **Based on recent Speak Up findings, teachers now report the following as the top five student outcomes when technology is used effectively within learning:**

1. Students learning at their own pace **52%**
2. Students directing their own learning processes **42%**
3. Students collaborating more with each other **41%**
4. Students are more engaged in learning **38%**
5. Students communicating more with their teacher(s) **35%**

As a result of their experiences over the past few years, teachers now see that the development of student capacities, particularly around self-directed learning, is a valid and achievable outcome when they use technology effectively in their classroom. Parents also value this type of capacity development. When asked about the types of life skills their children will need in order to

to be successful in college and the workplace, 68% of parents say that the ability to learn new skills on their own is paramount for their children’s future. As depicted in Chart C, **over 90% of parents with students across the entire K-12 spectrum believe that technology, when used effectively and appropriately, has a positive impact on their child’s learning potential and success.**

**Chart C: Parents’ perceptions of the value of technology use within education**



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The key for parents is that they want to understand the efficacy of technology usage within learning. The increased sophistication of teachers using technology to help students develop college and workplace skills is a good step in the direction of providing an answer to that important parent question.

Our students have a long history of leading the way in terms of thinking differently about the outcomes they see from effective technology use in school. They did not need the pandemic and virtual learning to shift their perceptions. In 2018, for example, 56% of grade 6-8 students and 52% of Grade 9-12 students said that learning at their own pace was a significant outcome. And in 2014, while most educators were still focused on the impact of technology on student engagement, only 40% of high school students considered that a meaningful benefit. For today’s students, technology is a utility. **It makes sense, therefore, that 60% of high school students see technology as a vehicle that helps them learn at their own pace and facilitate greater collaboration opportunities with classmates** (Table 5).







**Table 5:** Grade 6-12 students' assessment of the outcomes from effective technology use in the classroom

Student outcomes from the effective use of technology in the classroom	% of students who report agreeing with these outcomes	
	Grade 6-8 students	Grade 9-12 students
Learning at my own pace	57%	60%
Collaborating more with classmates	49%	60%
Directing my own learning processes	49%	56%
Communicating with my teacher(s) more	41%	56%
Increasing my engagement in learning	36%	38%

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Students see the effective use of technology within their learning lives as a must-have, not a nice-to-have. **When asked in the recent Speak Up surveys, 50% of students in grades 6-12 agreed that “I am a better student when I can use online and digital tools to support my learning.”** Additionally, 55% believe “knowing how to use technology effectively is an important skill that will help me in the future.” When thinking about how to increase the efficacy of technology use within learning, educators should keep

in mind that the experiences that students are having today in the classroom, particularly with digital tools and resources, will have an impact on their future abilities to thrive and compete in the increasingly technological society and workplace. The pandemic opened the door for educators to think differently about the use of technology within the learning process. The next step is how to expand and sustain those changes.

## Finding #3

**Teachers have a different perspective today on what they need for more effective technology use in their classroom, and that new viewpoint includes more support from their school or district, especially in terms of higher-bandwidth connectivity. Students agree.**

**D**espite significant investments in district bandwidth and classroom connectivity, both students and teachers say that slow, inconsistent, and unreliable Internet access in the classroom continues to thwart more effective uses of technology within the learning process. In 2014, 54% of teachers cited the lack of student devices as the primary challenge they faced in using technology in their classroom. Only 9% of teachers today identify that as an obstacle. But as teachers have effectively integrated a host of online tools and resources within the everyday curriculum, the quality of the bandwidth in their classroom has become more critical. Along with identifying student devices not being charged or having adequate battery life (39%) as a barrier, 34% of teachers say access to the Internet in their classroom is insufficient to support

current classroom needs. **And nearly 6 in 10 high school students (59%) and 49% of middle school students say Internet connectivity in their classrooms is simply too slow or inconsistent to appropriately support meaningful classroom learning with online tools and resources** (Table 6). This situation is not a reflection of community demographics or district funding levels. As evident in Table 6, high school students in suburban communities are just as likely to say that their classroom Internet connectivity is insufficient as their peers in urban communities.

Reflecting the new reality that students and teachers are using more online tools within the classroom experience, teachers also are seeking new guidance from their districts about effective use strategies and practices to model. In addition to improvements in classroom connectivity,

**Table 6: Top obstacles that prevent students from effectively using technology for learning in school: comparative demographic analysis**

% of students who chose these as obstacles	Obstacles that prevent students from using technology for learning in school		
	School blocks websites we need for learning	Internet is too slow or inconsistent	There are too many rules about technology use
<b>Schools in urban communities</b>			
Students in grades 6-8	53%	54%	41%
Students in grades 9-12	76%	61%	37%
<b>Students in suburban communities</b>			
Students in grades 6-8	50%	56%	36%
Students in grades 9-12	59%	63%	32%
<b>Students in rural communities</b>			
Students in grades 6-8	43%	51%	40%
Students in grades 9-12	62%	53%	42%

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teachers say that the following would be very helpful as they continue to navigate the journey to more effective technology usage:

- A curated set of online resources organized by grade level and content area
- A list of recommended online and digital resources approved by my district
- Online tools that help organize and keep track of digital resources
- Information about classroom management strategies using digital resources
- Teacher evaluations of how certain digital resources performed in their classroom

As a result of the pandemic and the virtual learning experience, not only did teachers' perceptions of the value

of technology within the learning process change, but their list of needs for classroom support did as well. **In 2018, only 32% of teachers said they needed a curated set of online resources organized by grade level and content area. Today, 58% of teachers are seeking that information to inform their classroom digital learning plans.** Similarly, while 44% of teachers today say online tools to organize their digital assets would be very helpful, only about one-quarter (28%) of teachers felt that was a need in 2018. This change in what teachers say they need in order to use technology more effectively is further evidence of their changed mindset around digital learning. In thinking about how to better utilize technology to support new student learning experiences, teachers are still interested in professional learning on certain tools or new learning models, but they are also looking for their district leadership to provide support materials and recommendations that they can use immediately to increase their own classroom effectiveness.

## Finding #4

**Students, teachers, principals, and parents have a clearer vision today about the types of technologies that can support more effective classroom instruction and enhanced learning outcomes for students. Central to that vision, however, is the need for classroom Internet connectivity that is consistent, reliable, and appropriate to support digitally infused instruction.**

**E**ach year on the Speak Up surveys, Project Tomorrow asks students, teachers, principals, and parents to envision the school of the future, the optimum learning environment where technology is used purposely to advance student skills in preparation for future success. These K-12 stakeholders are asked to identify the technologies that they think will have the greatest impact on student outcomes. As would be imagined, this wish list of high-impact technologies has evolved significantly over the past 20 years. For example, in 2010, nearly two-thirds of school principals (64%) felt that computer projection devices in all classrooms would

result in the desired student outcomes. And in 2014, 56% of parents and 57% of teachers said that an interactive whiteboard was top on their list of technology for their ultimate school. The idea of providing every student with a digital learning device to support schoolwork was also just emerging in 2014. In that year, for the first time, a majority of teachers (59%) thought that was a good idea.

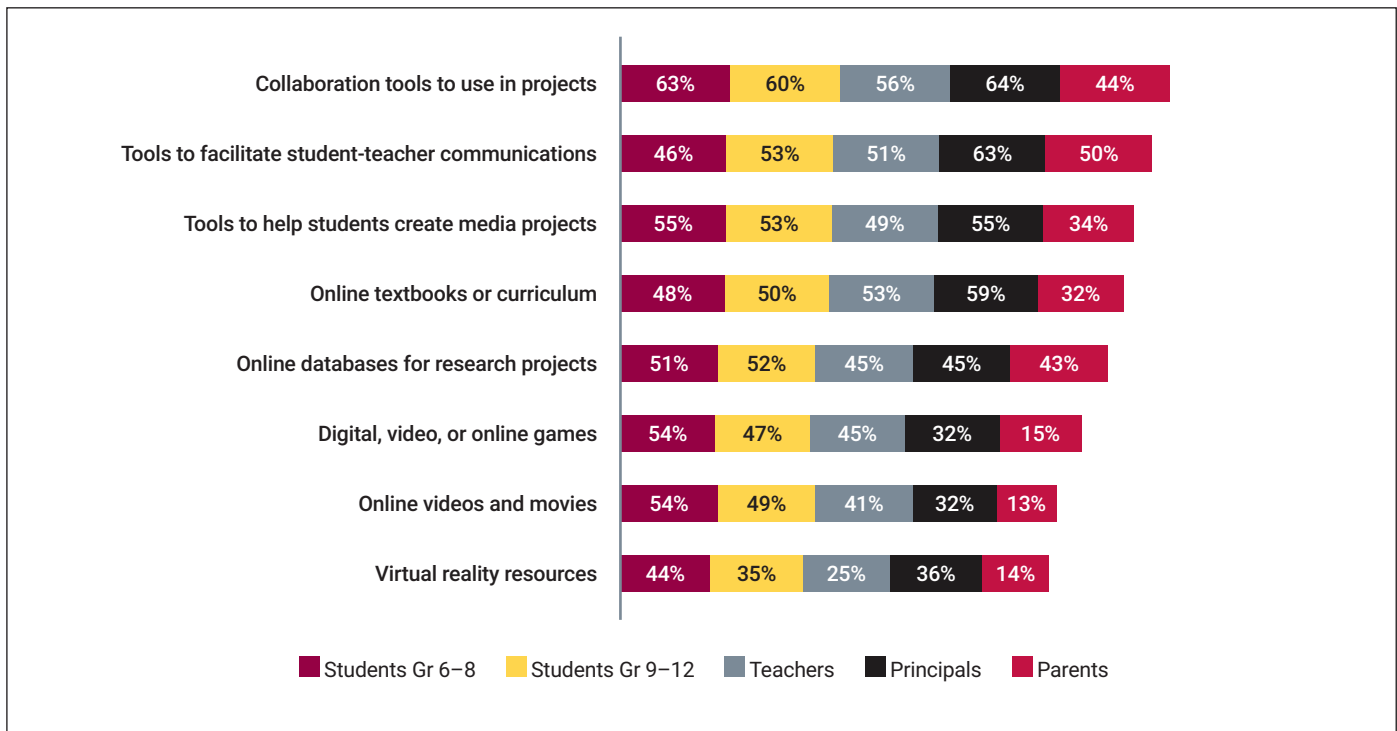
Today, students having a tablet, laptop, or Chromebook to use in class and increasingly to take home, as well, is deemed essential, not just a preference. With a new understanding of the value of student access to

technology within the learning process, 85% of teachers now identify a 1:1 program as a key requirement for a school's optimum learning environment. Over 90% of school principals (92%) hold that same view.

As discussed in this report, this shift in educator perspectives on the role of technology within students' learning has also resulted in a new list of "must have" technologies in schools. The Speak Up 2022 Ultimate School Profile now includes a heavier emphasis than in years past on online tools and resources that support deeper, more active learning experiences for

students (Chart C). Topping the list for teachers, school site administrators, and students in grades 6-12 are collaboration tools for students to use in projects. **At least 50% of high school students (53%), teachers (51%), principals (63%), and parents (50%) identify online and digital tools to facilitate student-teacher communications as having a credible impact on student outcomes in their vision of a future-ready school.** Other highly ranked technologies include tools to help students create media projects, online textbooks or curriculum, and online databases to support research projects.

**Chart D: Speak Up 2022 Ultimate School Profile – K-12 stakeholders identify the best technologies to support enhanced student outcomes**



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This comparative analysis of the perspectives of critical stakeholder groups can help a district leadership team understand the buy-in of those audiences around new technologies to support active learning. These results, especially at the local community level, can also help a school or district leader identify the infrastructure needs that can translate these aspirations into reality within their schools. A common denominator across this list of valued technologies is the essential need for high-quality,

high-bandwidth Internet connectivity in the classroom to support the type of digitally infused learning experiences empowered by these technologies. As we continue to think about how we are going to leverage the new energy around technology usage within learning to move beyond the classroom of today to the classroom of the future, appreciating the need for satisfactory infrastructure to support those aspirations is critical.

## Ending thoughts and questions for further discussion

As evidenced by the latest Speak Up Research findings, the K-12 education sector is at an important inflection point. The American classroom is rich with technology today, and teachers are using more digital tools than ever before to support classroom instruction. This increased access to technology has helped many teachers develop a more informed perspective of how digital content and resources can not only support their own productivity but enhance student outcomes at the same time. This change in teachers' mindsets about the benefits of technology use within learning represents an important by-product of the significant changes that have occurred in education over the past few years. Consequently, we are at a unique moment in time where the long-held promise of technology to transform education may be within sight. But more work is needed to ensure that technology is utilized appropriately

and effectively to support deeper, active learning for all students. And it is increasingly important that the technology infrastructure in our schools supports the goals of teachers and students as they explore more sophisticated uses of technology within learning. With that in mind, this third report in the Project Tomorrow – Spectrum Enterprise series is designed to help school and district leaders envision a new classroom environment that is more interactive, participatory, and personalized to ensure that every student is well prepared for future success. We encourage school and district leaders to utilize this report as a starting point for new discussions within your local community and as an input for designing a new future-facing vision for education. The following questions can help jump-start those important local conversations with your students, teachers, administrators, school board members, and community partners.

- 1 Over the past few years, there has been an explosion of new digital solutions and products in the marketplace to support K-12 education. The most important questions to ask today, however, are often not asked. We suggest starting with these: What are our educational goals? With those goals in mind, what digital solutions or products are the best ones to help us achieve our agreed upon educational goals? Which ones will help us ensure that technology use in our classrooms is supporting active, not passive, learning?
- 2 Many teachers are embracing new technologies and learning models to address learning loss or the need for learning acceleration in this post-pandemic era. The level of innovation in many classrooms has been impressive. But how are we going to sustain these efforts? Which best practices from the past few years should be sustained, and which ones should maybe be abandoned now? How do we build a future-proofing environment that supports the current innovations while also encouraging new ideas about better ways to utilize technology to support our students?
- 3 Technology use in schools has long promised a more personalized environment for all students. How can we leverage the increased access to technology in the classroom to create more individualized learning experiences for students? What do our teachers need in terms of professional learning and support resources to transform their classroom into personalized learning spaces that takes advantage of each student's unique academic strengths while also addressing where they may need remediation or additional support?

*For additional inspiration, check out the first two reports in this year's series of Project Tomorrow – Spectrum Enterprise reports on key trends in education technology:*

***Beyond the Homework Gap: Leveraging Technology to Support Equity of Learning Experiences in School***

***Beyond the IT Department: The Emergence of the CIO as a Digital Leader in K-12 Districts***

## About Project Tomorrow

Project Tomorrow’s nonprofit mission is to support the effective implementation of research-based learning experiences for students in K-12 schools. Project Tomorrow is particularly interested in the role of digital tools, content, and resources in supporting students’ development of college and career ready skills. The organization’s landmark research is the Speak Up Research Project, which annually polls K-12 students, parents, educators, and community members about the impact of technology resources on learning experiences both in school and out of school, and represents the largest collection of authentic, unfiltered stakeholder voices on digital learning. Since 2003, over 6.2 million K-12 students, parents, teachers, librarians, principals, technology leaders, district administrators, and members of the community have shared their views and ideas through the Speak Up Project. Learn more at [www.tomorrow.org](http://www.tomorrow.org).

## About Spectrum Enterprise

Spectrum Enterprise, a part of Charter Communications, Inc., is a national provider of scalable, fiber technology solutions serving many of America’s largest businesses and communications service providers. The broad Spectrum Enterprise portfolio includes [networking and managed services solutions: Internet access, Ethernet access and networks, Voice, and TV solutions](#). The Spectrum Enterprise team of experts works closely with clients to achieve greater business success by providing solutions designed to meet their evolving needs. For more information, visit [enterprise.spectrum.com](http://enterprise.spectrum.com).

### Resources

<sup>i</sup> [www.mckinsey.com/industries/real-estate/our-insights/americans-are-embracing-flexible-work-and-they-want-more-of-it](http://www.mckinsey.com/industries/real-estate/our-insights/americans-are-embracing-flexible-work-and-they-want-more-of-it)

<sup>ii</sup> [www.grocerydive.com/news/online-grocery-sales-increased-17-in-july/629179/](http://www.grocerydive.com/news/online-grocery-sales-increased-17-in-july/629179/)

<sup>iii</sup> [www.worldbank.org/en/news/press-release/2022/06/29/covid-19-drives-global-surge-in-use-of-digital-payments](http://www.worldbank.org/en/news/press-release/2022/06/29/covid-19-drives-global-surge-in-use-of-digital-payments)

<sup>iv</sup> [www.rand.org/news/press/2022/11/07/index1.html](http://www.rand.org/news/press/2022/11/07/index1.html)

<sup>v</sup> [www.ama-assn.org/practice-management/digital/2022-moving-beyond-telehealth-digitally-enabled-care](http://www.ama-assn.org/practice-management/digital/2022-moving-beyond-telehealth-digitally-enabled-care)

<sup>vi</sup> [www.pewresearch.org/internet/2021/09/01/the-internet-and-the-pandemic/](http://www.pewresearch.org/internet/2021/09/01/the-internet-and-the-pandemic/)



#### Report #1

<sup>vii</sup> [Beyond the Homework Gap: Leveraging Technology to Support Equity of Learning Experiences in School](#)



#### Report #2

<sup>viii</sup> [Beyond the IT Department: The Emergence of the CIO as a Digital Leader in K-12 Districts](#)

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