

Unfinished Business:

Understanding the
Digital Design Divide in
American Schools

Key findings from the
Speak Up Research Project®



In partnership with



Spectrum
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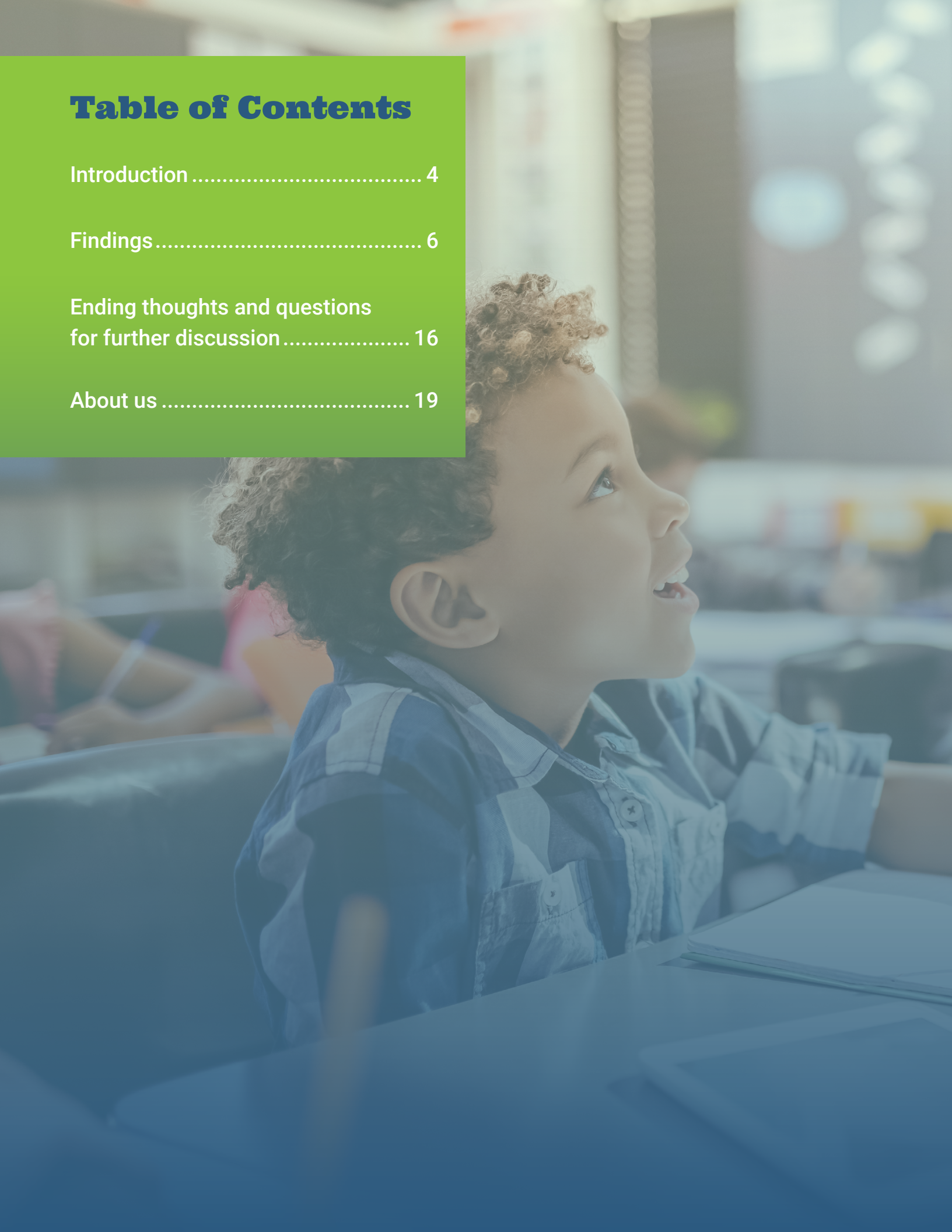
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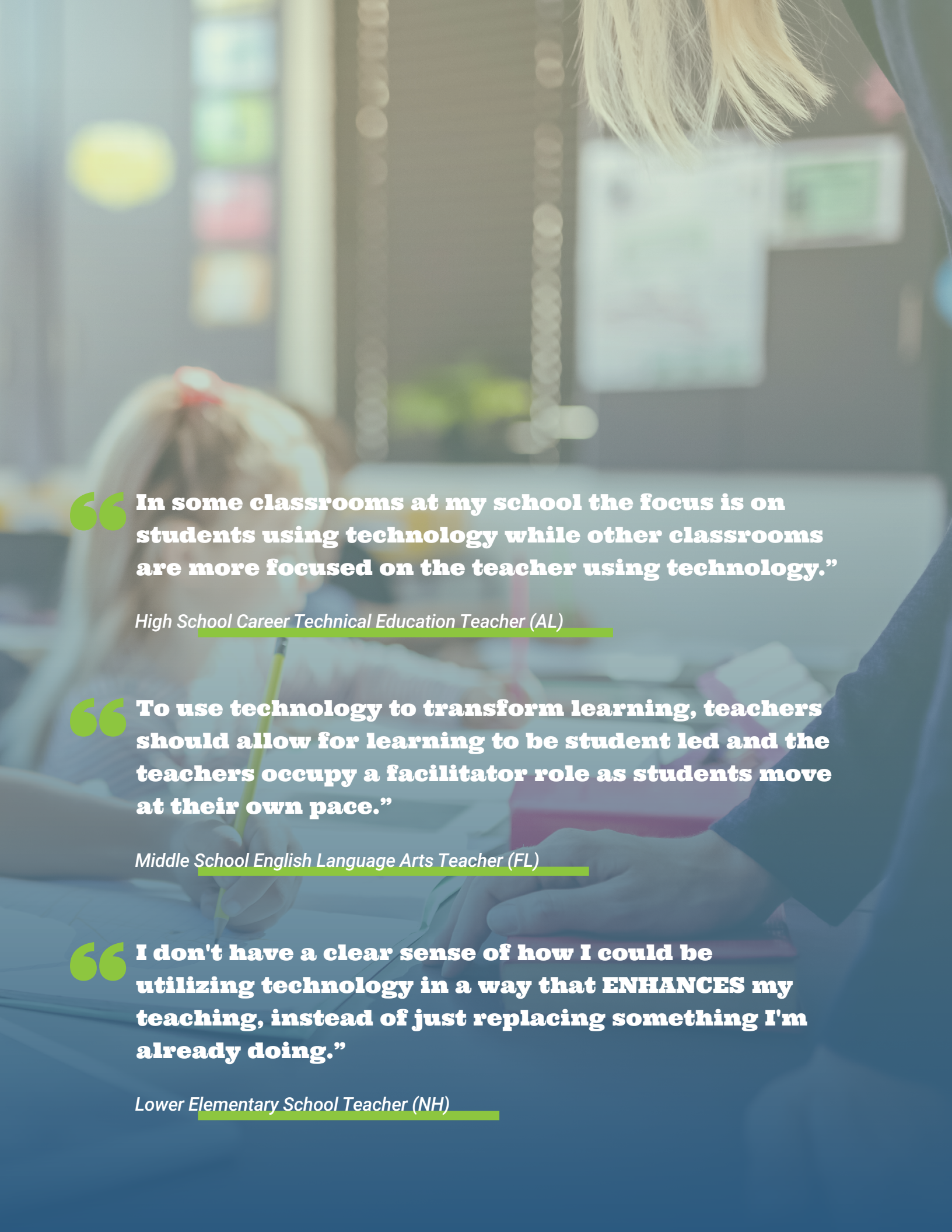
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“In some classrooms at my school the focus is on students using technology while other classrooms are more focused on the teacher using technology.”

High School Career Technical Education Teacher (AL)

“To use technology to transform learning, teachers should allow for learning to be student led and the teachers occupy a facilitator role as students move at their own pace.”

Middle School English Language Arts Teacher (FL)

“I don't have a clear sense of how I could be utilizing technology in a way that ENHANCES my teaching, instead of just replacing something I'm already doing.”

Lower Elementary School Teacher (NH)

Introduction

A prevailing belief in K-12 education is that every district, school and classroom is distinctive and unique, shaped by the students and staff, as well as by local context and culture. This belief is evidenced when examining school issues. For example, the issues that challenge school leaders in a large urban high school in Philadelphia may be very different than the concerns of a principal in a small rural high school in Oregon. Factors such as community demographics, school resources, and local priorities impact both challenges and opportunities in K-12 education every day. How successfully teachers use technology to support student learning is often impacted by such local factors.

More importantly, teachers' own personal valuation on digital learning and the level of support and guidance provided by their school and district leadership play a much larger role in the socialization of digital learning in a school. And while there are various well-known frameworks and recommendations for how to encourage teachers' effective use of technology within instruction, there is not one universal process or formula that is adopted for all teachers nationwide or even within the same school.

Based upon our 21 years of collecting and reporting on the authentic feedback of classroom educators about their use of technology within instruction, Project Tomorrow® has a unique perspective on the state of teacher adoption of technology within their classroom practices. The curve of technology adoption today is very similar to what we first reported in 2004. There continues to be a small group of early adopting, innovative teachers who are transforming the learning experience for their students through their design of student-centered learning in their classroom. Correspondingly, there remains a similarly small group of reluctant adopters who despite having

extensive technology access in their classroom tend to use those resources to primarily support teacher productivity or more passive applications with their students. Most teachers are in the middle of this bell curve. The unfinished business of how to most effectively support teachers in their adoption of technology within their instructional processes must be a continued focus for our nation and our local schools.

Though the phrase “Digital Design Divide” is relatively new within education circles, the existence of the divide has been documented for years. What is fresh today is the attention being paid to this divide because of an increased understanding about the relationship between teacher effectiveness with technology and student outcomes. The Digital Design Divide refers to the spectrum of differences in teachers' individual motivation and competency to design active learning experiences that effectively and appropriately use technology resources, and the gap that exists in teachers' access to high quality professional learning resources that can help them transform not just learning outcomes, but their instructional practices as well. Unlike the [Digital Access Divide](#) that focuses on the quantitative data about differences in student and teacher access to technology (both in school and out of school), and the [Digital Use Divide](#) that spotlights disparities in how technology is being used by teachers and students to create meaningful learning experiences, the Digital Design Divide is centrally focused on teacher capacities and the urgent need to re-design both classroom instruction and teacher professional learning.

In support of new local and state discussions about how to most effectively utilize technology in the classroom, Project Tomorrow, in collaboration with Spectrum Business®, is publishing a new series of reports that examine each of the three digital divides

through the lens of the Speak Up Research findings. The Speak Up Research findings provide an insider glimpse into the authentic views and values of K-12 students, teachers, administrators, parents, and families about the state of education, and particularly the role of technology within the learning process. Each report in this series provides foundational data to support a new emphasis on closing the access, design and use divides in American education, and identify specific areas of unfinished business that will help local, state, and national leaders understand the need for urgency and targeted attention on the inequities inherent in the divides.

In this third report in the special series, we examine how changes in teachers' mindsets and valuations on digital learning can result in transformative learning environments for their students. Additionally, this report provides new research findings about the teachers' desires for more effective professional learning to enable these new mindsets and valuations. Central to any discussion about designing new learning experiences for students using technology must be a conversation around what constitutes effective use of digital tools. Input from school administrators provides a new lens for supporting teachers to use technology most effectively. The Speak Up findings documented in this report include feedback from over 7,600 K-12 classroom teachers and nearly 1,000 school building administrators from 2022–2024. Where appropriate, we reference longitudinal data from the Speak Up Research dataset from 2003–2024 to provide additional context. School level demographic analysis of the research findings enables greater clarity to understand where gaps and unfinished business still exist relative to effective technology usage and teachers' professional learning needs.

Using the Speak Up Research findings as context, this report addresses the following three questions specifically related to understanding the challenges and opportunities of the digital design divide today in America's classrooms:

- Are teachers leveraging technology to design personalized learning activities in K-12 classrooms?
How comfortable are America's teachers in designing learning activities that empower students to have choice within the instructional environment?
- What do teachers need in terms of high-quality professional learning to close the design divide?

To support local discussions by school and district leaders, each report in this series concludes with a relevant list of discussion starter questions, appropriate for a cabinet meeting, school board meeting or community forum, to stimulate new ideas about how to address the digital divides.

For the past 21 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 6.3 million K-12 students, parents, teachers, and administrators have shared their first-hand 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 Business, has leveraged the most recent Speak Up Research findings to provide new insights for educators, policymakers, and community leaders about key education issues.

Finding #1

Understanding teachers' use of technology to support personalized learning experiences

"The key to this transformation is not to standardize education, but to personalize it, to build achievement on discovering the individual talents of each child, to put students in an environment where they want to learn and where they can naturally discover their true passions."ⁱ

- Sir Ken Robinson, education thought leader and author

Teachers have long strived to create more personalized learning experiences for their students. They agree with Sir Robinson that standardization is not the way to engage learners or to help them prepare for future success. But the day-to-day logistics of designing individualizing educational experiences for each student in a classroom of 24 or more 3rd graders, for example, is daunting for most teachers. Technology has long held the promise that personalized learning can be realized if appropriate digital tools and resources are strategically employed to support instruction, and teachers are proficient in how to leverage those tools to support students' individual academic needs.

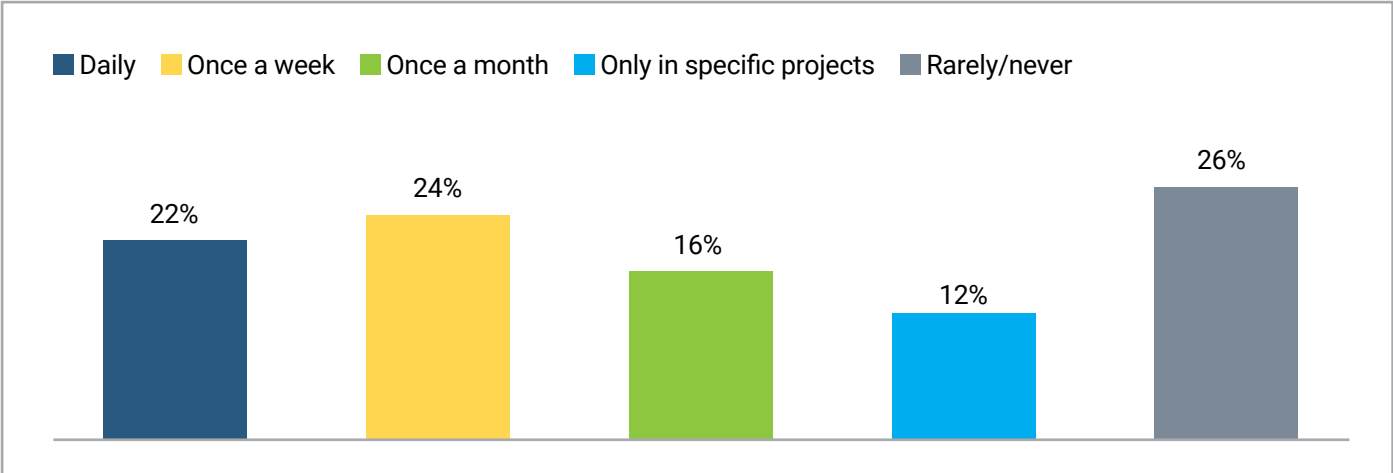
With the greater investment in technology resources for the classroom over the past few years, the assumption is that effective digital learning is the norm across most classrooms from kindergarten through high school. As reported in the first report in this series, Project Tomorrow research indicates that teachers and students certainly have greater access to technology within classrooms today. And the use of digital tools and resources within the learning process has become as ubiquitous as pencils and books in most classrooms. But the question remains: to what extent are teachers designing learning experiences with technology to support personalized learning and address individual student needs?



To answer that question, Project Tomorrow asked classroom teachers about their frequency of using technology to design learning experiences specifically to address the neuro-variability or individual needs of students in their class. Appreciating the unique learning differences and/or preferences of students is important for supporting differentiated instruction. Reflecting the general trends of technology adoption, only 22% of the teachers indicate that they are tapping into technology resources daily to create learning experiences that are customized for the unique needs of their students (Chart A).

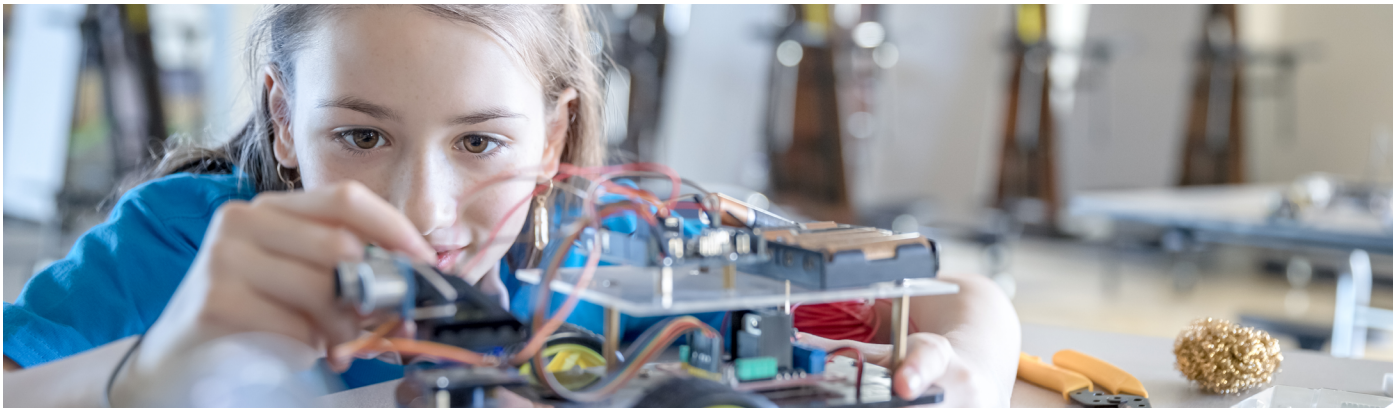
Correspondingly, a quarter of teachers (26%) say they rarely or never do that. And an additional 12% report only designing learning experiences with students' needs in mind for specific units or projects. As indicated earlier, most teachers are in the center of this bell curve of technology adoption to support personalized learning with 40% of teachers indicate they only use technology periodically or occasionally to support individual student needs. This is further evidence that the promise of technology to enable more personalized learning for all students is still an unfinished business item in many classrooms.

Chart A: Frequency of teachers using technology to design learning experiences to address neuro-variability of students



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To better understand the scope of the unfinished business, it was important to evaluate if there are differences in teacher behaviors, classroom technology tool usage, and technology valuation based upon this frequency divide. The views of teachers (62%) who reported designing learning experiences with technology to meet student needs on at least a monthly basis were compared with the views of teachers who said they only engaged in that design process for specific projects or never did so (38%).



Key findings from this evaluation include:

- Access to technology in the classroom is not a predictor of how often teachers are using technology to design learning experiences to address learner neuro-variability. The teachers who have never done that type of technology-enhanced lesson design are just as likely to be in a 1:1 digital device classroom as their colleagues who were designing with neuro-variability in mind. This underscores a central theme of this three-report series: students and teachers having access to technology in the classroom is necessary but insufficient to create new active learning environments without additional teacher professional learning.
- Despite the similar levels of access to classroom digital devices, the frequency in how often teachers use various digital solutions to support learning varies significantly based upon their approach to technology-enhanced lesson design. Five of the most common digital tools used in K-12 classrooms

today are games, online curriculum, databases, quizzes and videos. The difference in usage between these two groups of teachers is apparent across all five of these common tools. For example, while 55% of teachers who say they are designing instruction to meet individual student needs report using an online curriculum daily, only 39% of teachers who rarely or never do this use an online curriculum (Table 1). Over the past few years, the use of digital, online and video games has become more commonplace in most classrooms. Only 13% of teachers nationwide say that they do not incorporate games within their lessons or study units. However, among the teachers who have not yet embraced a technology-design approach to lesson development, 28% of those teachers say they are not using games within their classroom instruction, over twice as many as the national statistic. Comparatively, 31% of the teachers who are designing with technology in mind are using games daily with their students.

Table 1: Comparative analysis of teachers’ instructional technology usage based upon their likelihood of designing lessons for student neuro-variability

Most commonly used digital tools in K-12 classrooms	Percentage of teachers who report daily usage of the identified digital tool	
	Teachers who create technology-enhanced lessons to support individual student needs	Teachers who do not create technology-enhanced lessons to support individual student needs
Online curriculum	55%	39%
Online databases	31%	18%
Digital or online games	31%	20%
Videos	26%	15%
Quizzes and assessments	25%	15%

Teachers who are taking advantage of technology attributes to design more personalized learning experiences for their students are more likely to say technology positively impacts their instructional practices. For those teachers, the promise of technology to enable individualized instruction is a reality in their classroom. Three-quarters of these teachers (74%) say that they are doing more differentiation of learning because of technology. Only 51% of their colleagues who are not designing lessons or units with their students' neuro-variability needs in mind report the same impact from their classroom technology usage. The teachers who have embraced personalized learning explicitly in their lesson designs are also more likely to say that they are creating more interactive and engaging lessons (72%), implementing more student-centered learning (64%) and that they are more aware of their students' needs now (51%).

While a significant number of teachers are tapping into technology resources to better meet the individualized learning needs of their students, over one-third (38%) of classroom educators are not doing that yet on a

regular basis. For the students in those classrooms, their learning experience is most likely more standardized than personalized. And technology usage may also be in support of passive rather than active learning as evidenced by the Speak Up results. The differences noted between these two cohorts of teachers – those who have embraced technology to support individual students needs and those that have not – appears to be directly related to teacher skills with technology and their comfort levels using digital tools in the classroom.

Notably, while the majority of teachers (70%) say their technology skills are average, 22% rate their classroom technology skills as advanced. But only 14% of teachers who are not designing instruction for learner neuro-variability consider their skills to be advanced, and 18% say they are technology beginners. This gap in self-assessed skills provides further evidence of the need for more effective professional learning to close the Digital Design Divide. A similar gap in teachers' self-identified comfort with new classroom models, notably around embracing student choice, provides additional evidence for the same need.





Finding #2

Examining teachers' comfort with designing learning activities that empower students to have choice within the instructional environment

"Students are more successful when they are involved in the process of their own learning, when they understand the goals, and when they have control over how they achieve those goals."ⁱⁱ

- John Hattie, educational researcher and author

Reports one and two in this series discussed teachers' levels of comfort with using technology to support classroom goals such as differentiating instruction, facilitating student collaborations and employing data from digital tools to inform new instructional practices.ⁱⁱⁱ Approximately one-quarter of classroom educators say they are very comfortable using technology to differentiate instruction (24%) and to facilitate student collaborations (26%). Over one-third of teachers (38%) say they are very comfortable using the data derived from their use of digital resources in their classroom to make changes in

their instructional approach in their classroom. The Speak Up surveys also ask teachers about their comfort level using digital tools and resources to provide their students with opportunities to make choices within the learning process. Many educators, education thought leaders and researchers advocate for student choice as helping students develop self-agency and self-efficacy as learners. But those outcomes do not happen magically without teachers deliberately and specifically designing learning experiences and environments that empower student choice on a regular basis.

Teachers are asked on the Speak Up surveys to evaluate their level of comfort (choices: *very comfortable*, *somewhat comfortable* or *uncomfortable*) relative to the following two statements about student choice:

- 1

Allowing student choice in identifying a problem or question to address a learning standard
- 2

Allowing student choice about the strategies and tools they use to demonstrate learning

Whereas 27% of teachers say they are *very comfortable* with enabling student choice around strategies and tools to demonstrate learning, and 35% say they are *very comfortable* with students being able to identify a problem

or question for learning, the results vary based upon the grade level assignment of the teacher. As noted in Table 2, middle school (grades 6-8) teachers are more likely than their peers in elementary or high schools to say they are *very comfortable* with these practices. Elementary teachers report the highest percentage of all teachers saying they are *not comfortable* with student choice. On the surface, student choice is often thought of as most appropriate for the high school or maybe middle school classroom. However, developing student agency and self-efficacy should not be limited to only those learning environments. It is equally important for elementary students to develop those mindsets as well. This requires us to think differently about what choice may look like in the elementary classroom, but it does not negate the value.

Table 2: Teachers’ comfort with student choice – disaggregated by teacher assignment grade band

Teachers by grade level and comfort level	Allowing student choice in identifying a problem or question to address a learning standard	Allowing student choice about the strategies and tools they use to demonstrate learning
K-5 Teachers		
Very comfortable	24%	26%
Somewhat comfortable	56%	56%
Not comfortable	20%	18%
Grade 6-8 Teachers		
Very comfortable	31%	32%
Somewhat comfortable	57%	55%
Not comfortable	12%	13%
Grade 9-12 Teachers		
Very comfortable	26%	26%
Somewhat comfortable	63%	64%
Not comfortable	11%	11%

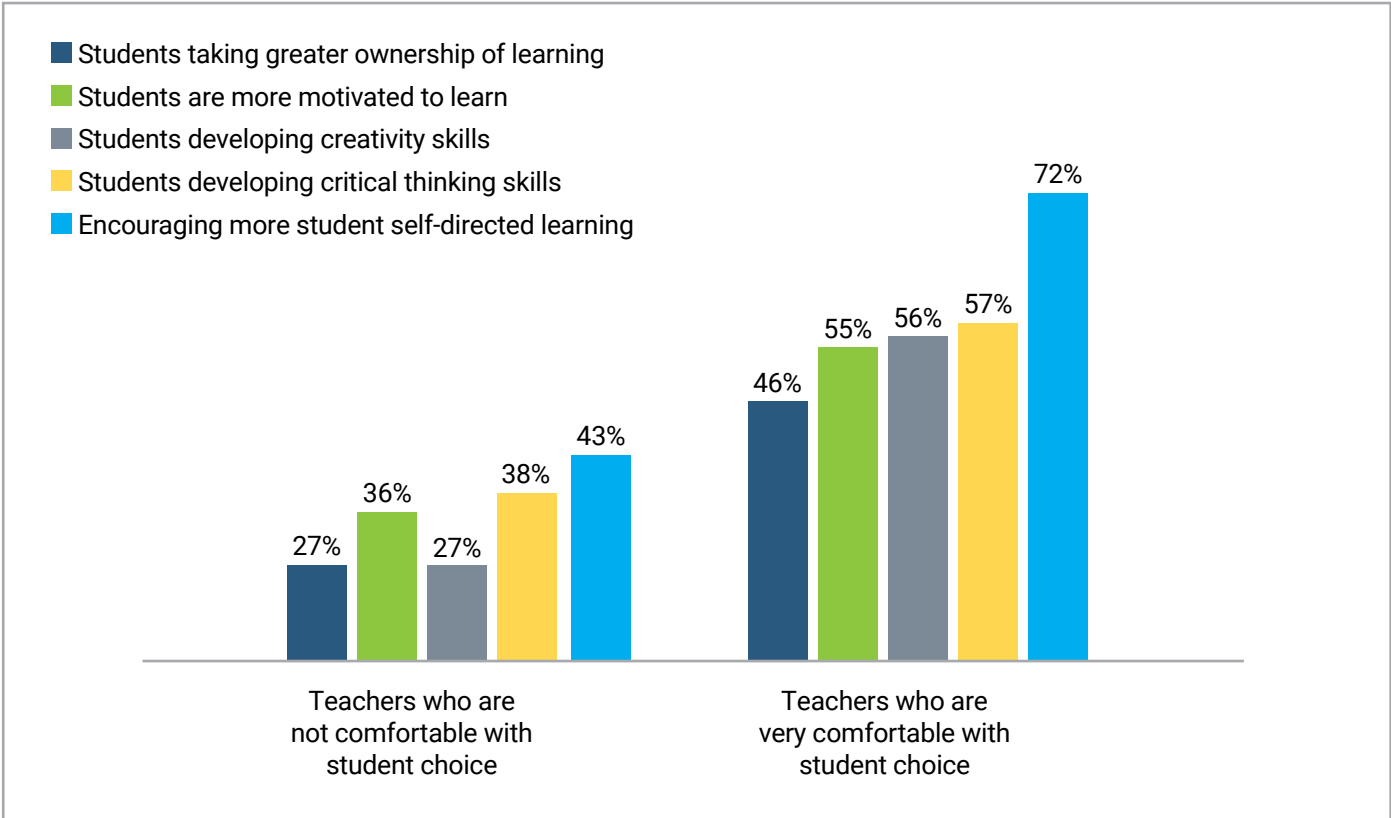
The paradigm of the “answer teacher” in American education is real. The answer teacher may be quick, for example, to jump in with an answer to a student question without empowering the student to seek their own answers or to solve a problem on their own. A physics teacher who answers a student question about velocity, acceleration, and distance by saying “I don’t know” when clearly, they have the content knowledge to answer the question, is creating a classroom environment that values student self-initiated learning and personal self-efficacy as a learner. A teacher’s mindset about enabling greater student choices in their classroom seems to have a ripple effect in terms of a teacher having a higher valuation on the impact of technology within learning.

Teachers that say they are *very comfortable* with both student choice use cases (i.e., choice in identifying a problem or question and choice about strategies and tools) are more likely to say that technology has had a

larger impact on their teaching practices and student outcomes than teachers who are *not comfortable* with choice. For example, 55% of the teachers who are *very comfortable* with student choice say that technology use in their classroom increases student motivation to learn. Only one-third (36%) of teachers who are *not comfortable* with student input into instruction report the same benefit about student motivation (Chart B).

Teachers who design learning experiences for their students that include the use of appropriate technology tools and allow for elements of choice within those designs are helping to redefine the role of the teacher in their classroom through their actions. In the process of moving beyond the “answer teacher” role into a new role as a “learning facilitator,” teachers are embracing not only more digital learning in their classroom but also recognizing new benefits from that technology usage, especially with their students.

Chart B: Classroom technology usage outcomes



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For students, this relationship between technology usage and being able to direct their own learning choices is not a novel phenomenon. Nearly two-thirds of students in grades 6-12 (62%) nationwide say school would be a more effective learning environment if they could make more choices about how they would like to learn. Back in 2015, a similar percentage of students (53%) also noted that they liked learning environments where they can be in control of when and how they learn.

While 52% of teachers say they need more professional learning to understand how to effectively use technology to differentiate instruction, only 31% say that they are interested in learning how to facilitate greater student ownership of their own learning. There is an obvious contradiction here. To effectively use digital tools and resources for personalized learning inherently means that classroom learning experiences should place the development of individual student agency and learning ownership in the hands of the learner. But that is not happening today in most classrooms. Professional learning for our teachers, therefore, remains an unfinished business relative to closing the digital design divide. It is imperative that school and district leaders help their teachers connect the dots between technology usage and student self-efficacy through greater attention to the design of the learning experiences in the classroom.



Finding #3

Re-thinking what teachers need in terms of professional learning and support to create the best learning experiences for students today

“The holistic approach to teachers’ growth and passion requires a blend of structured development, innovative inspiration, and moments of self-directed exploration. By fostering an environment that values professional development and individual creativity, schools can ensure that educators continue to find joy, purpose, and fulfillment in their journey of shaping young minds. Just as teachers invest in their students, schools should invest in their teachers to cultivate a community of lifelong learners and ignite the spark of innovation that drives education forward.”

- Jerusalem Gebreziabher & Collin Thompson, Education Elements^{iv}

Overwhelmingly, school principals (87%) say that the effective use of technology within learning is important to help them achieve their school mission and vision for student learning. But they also acknowledge that their teachers’ proficiency in using technology effectively to design for optimum learning experiences using technology is still at the basic level. For example, only 18% of school principals say that their teachers are very proficient in using technology to differentiate instruction or enable personalized learning in their classroom.

From a priority standpoint, school principals identify five key professional learning topics as most important for helping their teachers develop greater proficiency and

capacity for designing and implementing new learning experiences for students using technology (Table 3). These professional learning priorities tie back to most school missions and visions for learning today including a greater emphasis on personalization, leveraging technology effectively and creating learning experiences that prepare students for future success beyond school.

How school leaders are operationalizing these priorities within their schools provides a valuable glimpse into a new approach to help teachers build capacity for designing learning experiences with technology. Traditional “one size fits all” professional learning days and events are in the past. Rather, recognizing that professional learning for teachers just like classroom learning for students needs

Table 3: School principals’ priorities for teacher professional learning topics

Teacher professional learning topics	Percentage of principals who prioritize this topic for their school
How to use technology to differentiate instruction	53%
How to use data from digital tools to inform or improve teaching practices	50%
How to create project-based learning experiences in the classroom	47%
How to use technology to support formative assessments	44%
How to facilitate greater student ownership of their own learning	42%

to be more personalized, school leaders are endorsing a mix of new learning modalities for their teaching staff. When asked to identify the ways they are supporting capacity development for their teachers around effective technological practices, the school principals identified the following methods:

- 1 Encouraging peer-to-peer sharing and co-learning experiences amongst the teaching staff (72%)
- 2 Modeling the effective use of technology tools in my professional tasks (55%)
- 3 Providing job-embedded coaching and mentoring on technology integration (53%)
- 4 Dedicating staff meeting time to discuss technology integration strategies (48%)
- 5 Providing just-in-time, as-needed, technology support to the teacher (42%)

Teachers are increasingly self-directing their own professional learning today. This includes developing a community of peers and colleagues to provide just-in-time support. And while teachers have always relied upon the teacher in the classroom next door or down the hall for ideas and resources, the difference today is that

these professional learning networks may be fully virtual with teachers exchanging ideas across schools, districts, states and countries. The commonality is the effective use of online and social media tools to improve their craft.

The Speak Up Research Project has long documented this popular trend of teachers' self-directed professional learning. Today, that trend now also includes the use of artificial intelligence sources to support just-in-time training or information needs. As noted in Table 4, elementary teachers (71%) are just as likely as their peers teaching high school classes (75%) to be going online to find resources and advice to support lesson plan development and delivery. Similarly, a majority of teachers across all levels of experience in the classroom are purchasing online lesson plans (61%) and following education experts on social media (58%) indicating a particular comfort with using technology to support their own productivity. And a quarter of our nation's teachers (26%) are again demonstrating their early adoption of new technologies by tapping into AI as a learning modality for their development. Most notably, middle school (33%) and high school teachers (34%) appear to be more likely to be early adopters of this emerging technology.

Table 4: How teachers are self-directing their own professional learning using digital tools and online resources

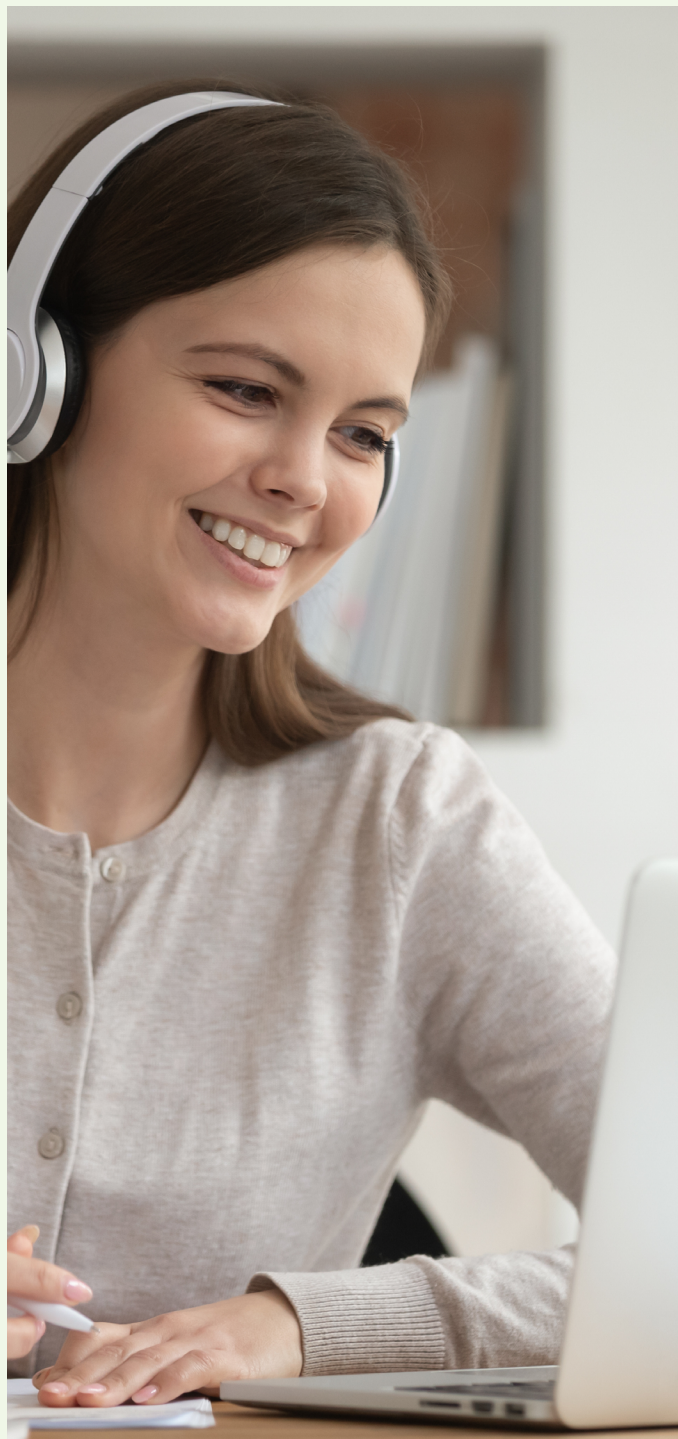
Professional learning methods	Teacher-reported methods of self-directed professional learning				
	All teachers	K-Grade 2	Grade 3-5	Grade 6-8	Grade 9-10
Found info online to support a lesson	73%	71%	75%	74%	75%
Purchased lesson plan from a teacher site	61%	68%	68%	65%	48%
Followed education experts on social media	58%	66%	65%	60%	55%
Listened to a podcast	43%	45%	47%	43%	42%
Watched online videos	38%	29%	35%	44%	45%
Sought help from other teachers through social networking	34%	34%	36%	35%	39%
Did research using a Generative AI tool	26%	20%	24%	33%	34%

Ending thoughts and questions for further discussion

The combination of school principals supporting teachers' capacity development with a more personalized approach to professional learning in their schools, and the widespread appeal of technology-enhanced, self-directed professional learning by teachers is important for this discussion about the Digital Design Divide. To close the Digital Design Divide, educators must think differently about the role of technology within the learning process, and to strategically and explicitly identify how specific digital tools and resources can help personalize the learning process for every student, meeting each student where they are in terms of their academic strengths as well as weaknesses. Design of the learning experiences in the classroom therefore are significantly more learner-focused with a premium placed on developing student self-efficacy and agency.

As noted in this report, there is still unfinished business that we must address to close the Digital Design Divide. However, it is encouraging that school leaders recognize the value of using personalized approaches to building teacher capacity and that teachers are gaining meaningful experiences with using technology to create more individualized learning experience for themselves. Project Tomorrow will continue to follow these emerging trends through our Speak Up Research Project.

In the meantime, we encourage school and district leaders to utilize this report to support their teachers in the design of digital learning experiences that support students' preparation for future success. That process starts with a greater appreciation of the connection between technology use in the classroom and the design



of those learning experiences to meet students' learning differences and preferences. The Speak Up findings shared in this report, and in the previous two reports in this series, provide valuable context for those discussions. The following questions can jumpstart important local conversations with your students, teachers, administrators, school board members and community partners:

1 What is our highest priority for the role of technology within our K-12 classrooms? Is it to support increased teacher productivity and effectiveness? Or is it to enable students to develop academic knowledge or future-ready skills? Or is it both? How can we more effectively articulate our priorities around technology use so that our teachers understand the connections between technology usage in the classroom and our school or district missions?

2 What do we believe about the potential benefits of helping students develop agency and self-efficacy as learners by enabling more student choice in the classroom? What is holding back teachers' endorsement of authentic student choices within learning? How can we help our teachers see beyond any perceived risks to embrace the advantages?

3 What types of professional learning do our local teachers need to be able to design new learning experiences for students using technology? What types of learning modalities will be most effective in our community? How can we more effectively support teachers' self-directed use of technologies, including AI, for professional learning and capacity building for innovation?

4 What can we do right now to inform, influence and inspire our teachers and building leaders to understand that closing the digital design divide is an equity imperative for our schools, our district and our community?





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 voice on digital learning. Since 2003, over 6.3 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 about our mission and work at www.tomorrow.org.

About Spectrum Business

Spectrum Business, a Charter Communications brand, empowers schools and districts to transform the student experience with networking, security, communications, collaboration and TV solutions. Our dedicated education IT experts serve hundreds of schools and districts nationwide with a network engineered for exceptional performance, end-to-end accountability and 100% U.S.-based support, available 24/7/365.

For more information, visit enterprise.spectrum.com/k12ed

Resources
ⁱ Sir Ken Robinson, PhD and Lou Aronica, " The element: How finding your passion changes everything ," Penguin, 2009.
ⁱⁱ John Hattie, " Visible learning for teachers: Maximizing impact on learning ," Routledge, 2012.
ⁱⁱⁱ " Unfinished business: Understanding the digital access divide in American schools ," Project Tomorrow, April 2024. " Unfinished business: Understanding the digital use divide in American schools ," Project Tomorrow, January 2025.
^{iv} Jerusalem Gebreziabher and Collin Thompson, " Prioritizing teachers' growth and passions: Creating a sustainable and engaged teaching team ," August 29, 2023.



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