

Approaching the
next frontier:
K-12 education
technology in the
wake of COVID-19



Introduction

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As time passes and more technology is adopted, teachers are increasingly comfortable with, and more frequently use, digital tools in their classrooms and for planning processes.

The COVID-19 pandemic prompted a major infusion of technology into the US K-12 education system with the forced shift to remote (digitally enabled) learning.

For example, ~60% of educators using digital planning tools adopted them during the pandemic, and daily usage of digital instructional materials has jumped from 28% prior to the pandemic's onset to 52% today. Now in the third school year impacted by the COVID-19 pandemic, we are at a critical juncture. As students have returned, devices in hand, to in-person learning in our K-12 classrooms, now is the time to consider: **How has teaching and learning changed, and what progress remains?**

In this report based on EY-Parthenon research, we discuss three “frontiers” of education technology adoption, with the impact on teaching and learning increasing with each (Figure 1):

Frontier 1 – Using technology as a substitute.

As time passes and more technology is adopted, teachers are increasingly comfortable with, and more frequently use, digital tools in their classrooms and for planning processes. However, they largely just shift activities and materials from print to digital format.

Frontier 2 – Using technology to drive collaboration and efficiency.

Teachers leverage technology to enhance their ability to collaborate with peers and make their planning, instruction and grading processes more efficient; while the teacher workflow is somewhat transformed, the student learning experience looks relatively the same.

Frontier 3 – Using technology to transform student learning.

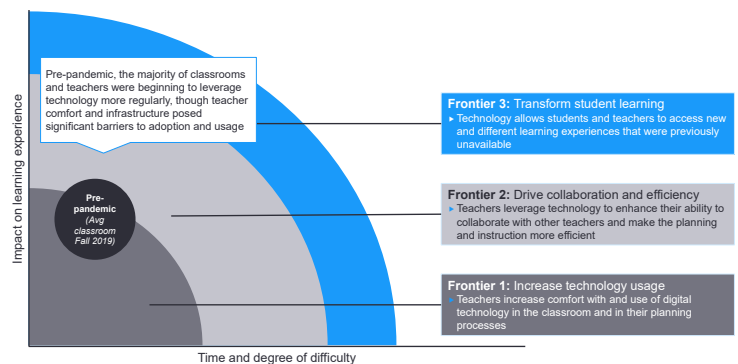
Technology allows teachers to reimagine their classrooms and the way they teach, and students to access new and different learning experiences.

Prior to the pandemic, technology use and availability varied

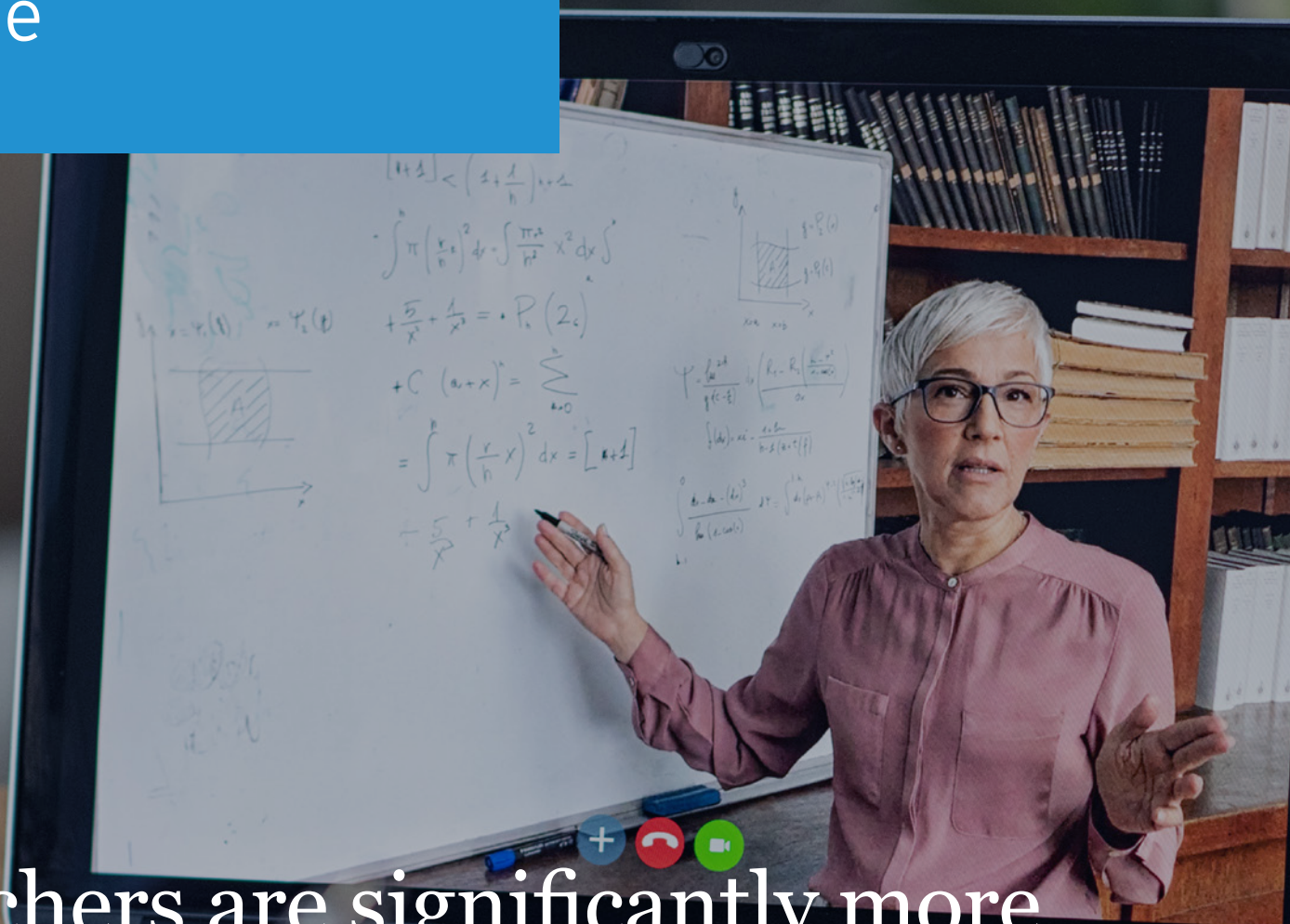


widely in classrooms across the country, but the average classroom was likely found in Frontier 1, making plodding progress toward Frontier 2. Fast-forward to 2020, and the adoption of education technology exploded in weeks. However, rapid adoption does not necessarily drive significant changes in behavior or improvement in instructional practices, so our research aimed to explore what has changed – and what really hasn't. During the fall of 2021, our team conducted more than 30 interviews and classroom observations and surveyed nearly 900 teachers. This report outlines our seven key findings and highlights outstanding questions as the uncertainty of the pandemic lingers.

FIGURE 1



Frontier 1: Usage



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Teachers are significantly more comfortable using more digital tools across planning, instruction and assessment as compared to pre-pandemic, and increasingly seek integrated, digital and data-rich products.

The first frontier can be defined by basic usage of technology in classrooms.

While technology adoption in K-12 education has generally lagged adoption for personal and business purposes, in the years prior to the pandemic, schools and districts were steadily increasing access to devices and technology in classrooms. Nevertheless, major infrastructure challenges remained, and 1:1 student-to-device penetration nationally was at ~55% prior to the start of the pandemic.¹ Teachers typically had computers to support planning, submit grades and correspond with parents or colleagues. However, high student-to-device ratios in many classrooms, and limited digital instructional content, meant that the teacher workflow – and in-class instruction – in most cases necessarily included a mix of paper-based and digital planning, instructional and assessment tools. The onset of the pandemic in March 2020 drove a major change in the presence and use of technology, for both students and teachers, virtually overnight.

Finding #1: Teachers are significantly more comfortable using more digital tools across planning, instruction and assessment as compared to pre-pandemic, and increasingly seek integrated, digital and data-rich products.

Unsurprisingly, teachers are using much more technology, and are using that technology much more frequently, than they were pre-pandemic. Teacher comfort with technology, which was widely cited as a barrier to adoption in pre-pandemic years, has increased significantly as the pandemic forced the use of digital tools to mimic the in-person experience. Teachers are now more familiar with, and comfortable using, digital tools across the full spectrum of the teaching experience – from planning to instruction and assessment.

Digital **planning** tools experienced a significant uptick in usage during the pandemic, with more than half of teachers reporting that they initiated regular use of their digital planning tools during the current school year (SY 2021-22) or last year (SY 2020-21). The surge in the use of digital planning

tools applies across all product types, including learning management systems (LMS), such as Canvas or Schoology, and content creation/collaboration platforms, such as Google Drive or Microsoft Teams (**Figure 2**). As teachers consider which planning tools they'll continue to use today and going forward, they remain interested in products that integrate with instructional materials. At the same time, they place increased emphasis on highly digital products that are easy to use when selecting among the myriad digital tools available (**Figure 3**). Among interviewed teachers, many noted that the variety of tools that their district or school made available to them during the pandemic enabled them to pick and choose a suite of products that were easy for them to pull together on their own. For example, several teachers highlighted their use of NearPod, GoogleDocs or their LMS as the tool into which they pull links to other products, tools or videos, thus effectively “integrating” products themselves during their planning process.

FIGURE 2

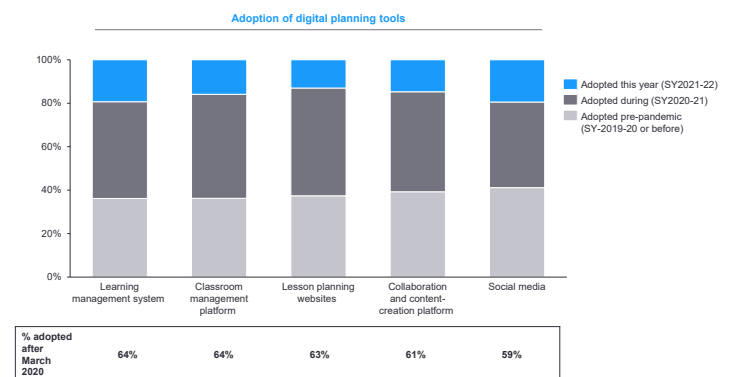
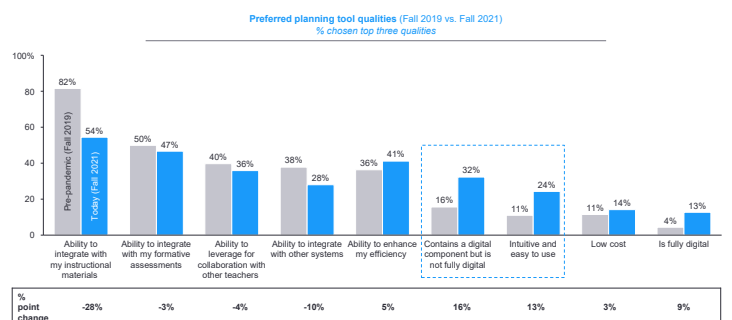


FIGURE 3



¹ Futuresource.

The use of digital instructional materials (e.g., core curriculum, supplemental materials) has similarly increased in light of pandemic-induced remote learning and device penetration. Roughly half of teachers report using digital instructional material daily, as compared to one-quarter to one-third pre-pandemic (Figure 4), a finding that is relatively consistent across subjects and grade levels. Rural and suburban districts experienced a greater uptick in digital instructional materials adoption; urban classrooms were typically already using digital instructional materials with higher frequency than non-urban classrooms prior to the pandemic. Today, however, the difference in usage by locale no longer exists: ~50% of classrooms across rural, suburban and urban settings are using digital instructional materials daily. Integration remains of high importance when selecting core curricular products, though, today teachers are more apt to seek digital products and those highly recommended by peers. Among supplemental materials, data tracking capabilities and standards alignment are seen as more critical (Figure 5).

Assessment solutions² have also become more prevalent in today's classrooms. The use of daily assessments nearly doubled, from ~25% of teachers using them pre-pandemic to ~40% using them in the fall of 2021. Three in four teachers today report assessing their students on at least a weekly basis, and the vast majority of this assessment usage is digital. Beyond digital capabilities, today's teachers seek assessment products that provide rich data to track student progress and skills mastery while also integrating within the existing teacher workflow (Figure 6).

Finding #2: Access to, and the use of, digital tools increased so quickly, and to such a large extent, that adoption was haphazard, lacked structure and resulted in a number of overlapping tools for educators

While the pandemic increased teacher comfort with, and use of, digital tools in their classrooms, it also inundated teachers with a variety of tools for planning, instruction and assessment at a scale not previously seen. As one teacher remarked, "My

district decided to give teachers a 'choose your own adventure' menu of technology, professional development and resources available by grade level. They let us as teachers decide what to explore and use." The diversity of resources available to teachers, and the associated teacher agency in selection and usage, has caused teachers to rely most heavily on peer recommendations when selecting curricula, as mentioned previously (Figure 5).

FIGURE 4

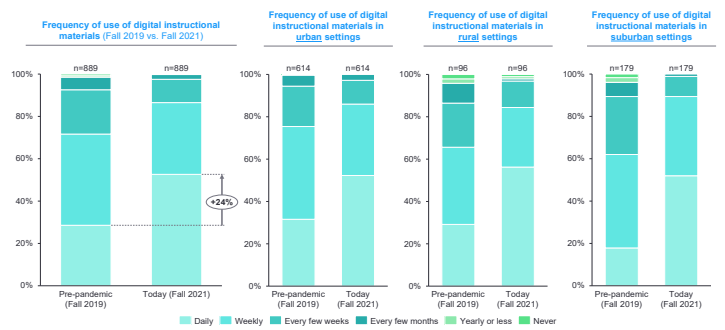


FIGURE 5

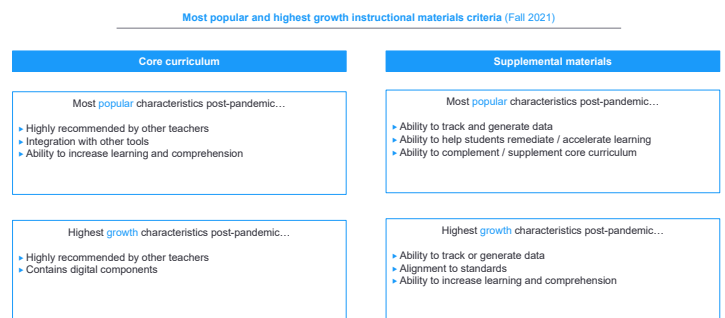
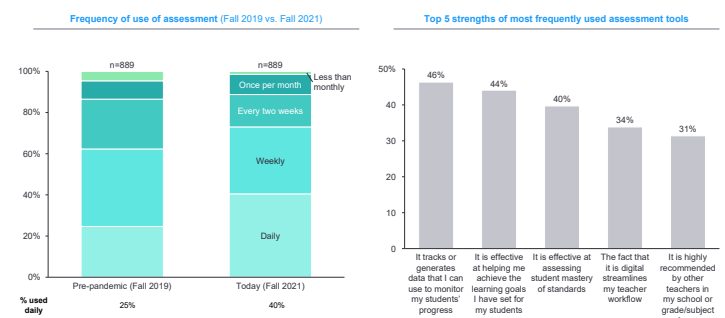


FIGURE 6



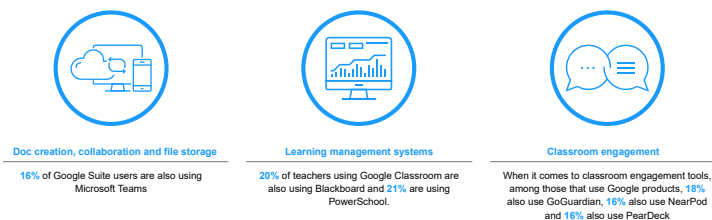
² The survey asked teachers to consider all kinds of assessments, including formative, benchmark and summative. However, this paper primarily refers to formative assessments, which are used on a more frequent basis.


The steep increase in the use of Google products for instruction and planning is a clear demonstration of the more unstructured nature of materials adoption during the pandemic. Today, ~72% of teachers use Google Classroom as an LMS and ~48% use the Google Suite (Drive, Docs, etc.) as a collaboration platform. Both are the most frequently used products within their respective categories. Furthermore, these products are frequently used alongside other district-provided tools, like Teams, Blackboard and PowerSchool, and classroom engagement tools, such as Nearpod and PearDeck (Figure 7). One Canvas user outlined how they use both a district-required LMS and Google products: “Google Docs is where everything lives for my class. I attach slides into Google Docs, and link assignments into Canvas.” Another teacher reinforced the dichotomy between district-required tools and those that teachers prefer, noting, “I’m a rule follower and use [our district’s official LMS], but other teachers have decided to still use Google Classroom and like it better. The Google Classroom interface is more friendly for students. [Our official LMS] has an older-feeling interface, and students get more confused with it.” While this phenomenon exists to a larger extent with Google products, given that they are free, the pandemic also pushed schools and districts to purchase and use potentially duplicative paid products. Nearly 10% of teachers reported Go Guardian alongside Nearpod or PearDeck for classroom engagement, and ~5% used Illuminate and Bright Bytes or PowerSchool for data analytics. Given the myriad challenges that teachers faced during the pandemic, from supporting students remotely to reimagining their classroom management and instructional approach for a virtual setting, perhaps it comes as no surprise that teachers regularly “mixed and matched” resources, prioritizing tools that were easy to use and enhanced student engagement.

At the same time, teachers report a desire for stronger school or district guidance when it comes to the broad use of digital in the classroom, as well as for the use of specific digital tools. One teacher remarked, “We haven’t received any mandate or guidance regarding technology use. We just need to make sure content is available if a student needs to quarantine.” Furthermore, when answering the question “What are the primary challenges to incorporating digital materials in your classroom today?,” 42% of surveyed teachers ranked a lack of guidance from the school/district among their top three challenges. For many teachers, the tools used in their classroom look widely different from those of March 2020 and before, and some feel that they need more overarching guidance to effectively navigate the transition, especially while they are also contending with student learning loss and the increased social-emotional needs of students following the pandemic’s period of remote learning.

“While teachers’ comfort with — and use of — digital planning tools and instructional materials has greatly increased over the last two years, opportunities to drive more effective usage remain through additional training and guidance for educators and greater curation of easy-to-use, high-quality tools.

FIGURE 7



A photograph of three teachers, two women and one man, leaning over a table and looking at documents together. They appear to be in a collaborative meeting or planning session. The woman on the left is smiling and looking down at the papers. The woman in the middle is looking intently at the documents. The man on the right is partially visible, looking towards the center. The background is slightly blurred, showing what might be a classroom or office setting.

Frontier 2: Efficiency and collaboration gains

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Many teachers have experienced significant gains in collaboration with peers, thanks to the adoption and proliferation of digital planning tools in particular.

The second frontier can be characterized by the use of technology to drive efficiency and greater collaboration.

For students, this may involve submitting practice assignments or homework online, or working on a group project with other students in a “live” document. For teachers, this may involve administering assessments or assignments online or in tools that can automate grading, or collaboration with other teachers in their grade or subject group to plan for an upcoming instructional unit. While, for both students and teachers, the use of technology may make these processes more streamlined or more efficient, it does not represent for either group a significant change to the approach to learning or teaching absent this technology. While some schools and classrooms were using technology in this way prior to the pandemic, the pandemic drove significant device penetration and investment in collaboration platforms, thus shifting the majority of K-12 schools and classrooms into the “second frontier” today.



Finding #3: Many teachers have experienced significant gains in collaboration with peers thanks to the adoption and proliferation of digital planning tools in particular.

Throughout this research effort, teachers highlighted how the transition to digital has facilitated cross-classroom and whole-grade-level collaboration, which has enhanced their planning process significantly. The desire for planning tools that enhance collaboration with other teachers remains in the top five characteristics that teachers look for in planning tools (Figure 3).

Furthermore, the interview process revealed that teachers see a lot of value in the collaboration available through digital tools, with one teacher explaining, “I use this tool because my whole team uses it. We all upload content to our shared platform, and we can all reference materials throughout the year.” Another interviewee noted that an increase in collaboration has helped that interviewee learn how to better identify sources of content and integrate their own materials while also reducing the amount of planning that any one team member must do, citing,

“My team splits up and everyone takes a subject to plan, and then we rotate. We use several tools and pull from a variety of sources. When we switch, we learn how others are going about the planning process.” Teachers are also able to use digital tools to collaborate with other teachers that they may have never met. One teacher highlighted leveraging existing instructional resources from an online quiz platform, Kahoot!: “I love polls and giving them live in class allows students to see the data breakdown ... I use Kahoot! a lot and they offer a huge library of premade Kahoot! (quizzes) for my subject or topic.” In the return to in-person learning, it is clear that teachers are beginning to leverage the efficiency and quality gains that can come from enhanced digital collaboration.

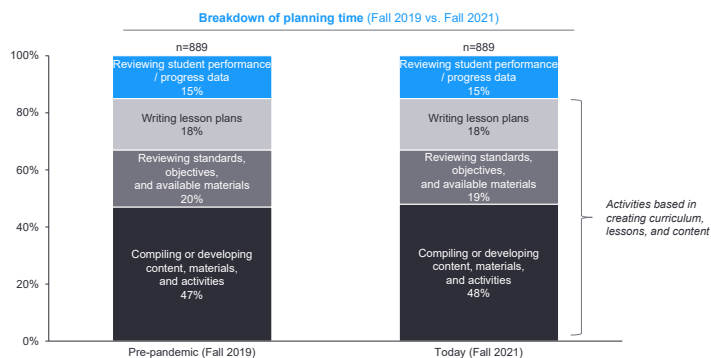
Finding #4: Most teachers are not fully benefiting from efficiency available through digital tools beyond grading, and instead fit the tools within their existing workflows and processes.

At the same time, our research indicates that, while teachers have a number of digital tools at their disposal, there is little change in the amount of time and effort required to develop lessons and learning experiences for students. Teachers report that they continue to spend the same total amount of time planning for their classes, averaging ~15 hours per week, both pre-pandemic and today. Furthermore, teachers share that they spend their time similarly across the same planning activities as they did pre-pandemic. They are still spending the vast majority (~75%) of their time creating curriculum, lessons and content for students (e.g., writing lesson plans, reviewing materials), while only a small portion of time is dedicated to reviewing the growing volume of assessment data vital to support students returning to school with pandemic-related learning loss (Figure 8). Some teachers shared that, while they are assessing students more frequently to track specific learning needs and gaps, they are also keenly aware that many of their students require additional types of support (social, emotional, mental health, etc.) today. Thus, teachers are not investing incremental time in reviewing assessment data but instead in planning for, and supporting, the greater diversity of needs that their students present today.

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I try to emphasize not using too much screen time but leverage the tools to help enhance my normal processes.

At this point, the activities and time involved in the planning process have not undergone significant changes, despite the influx of digital tools and the corresponding enhancements in collaboration. While the pandemic is ongoing and the changes it has brought about are recent, it nevertheless appears that the recent uptick in the adoption of digital tools has not meaningfully transformed the role of the teacher but instead just improved the efficiency of the existing workflow and structures. As one interviewee explained, “I’ve been leveraging the technology to streamline my old workflow: I use it for attendance so students can get right into their morning work, for directions, and for quick assessments. I try to emphasize not using too much screen time but leverage the tools to help enhance my normal processes.” Questions remain as to whether technology could, or should, transform the amount of time that teachers spend planning, as well as the activities they engage with during this process.

FIGURE 8

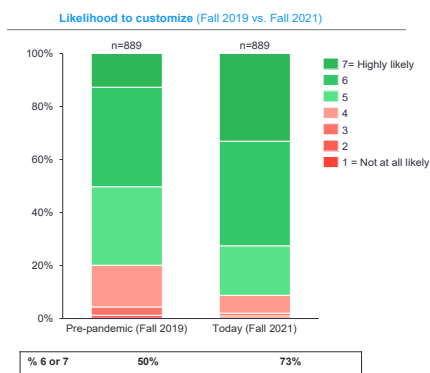


One place where technology has uniformly led to efficiency gains is when grading. Throughout interviews, teachers cited the increased efficiency from automated grading activities (e.g., Google Forms) and integrations between LMS and SIS to score and report grades as critical. One high school teacher explains, “Canvas (LMS) syncs with Skyward (SIS), our school gradebook, which is a huge time saver. The Speed Grader function in Canvas is embedded in assignments and allows teachers to grade a number of assignments quickly.” Teachers highlight the enhanced efficiency and ease enabled by technology, with another teacher reporting, “Now that we have one-to-one Chromebooks, managing my classes is much easier with less papers and less grading by hand now that it is all done in Google Classroom.” Teachers are even leveraging additional tools beyond LMS to augment the type of grading that can be done automatically, with one teacher highlighting, “Doctopus and Goobric are two Google plug-ins that allow me to make rubrics, easily grade student work, and embed the rubrics within the student’s Google Doc.” Ultimately, the emphasis on automated grading as the new normal is so critical that one teacher believes, “Now, time spent grading feels like time wasted. The less time I can spend typing in a score, the better.” While teachers appear to have used technology to make one component of their workflow more efficient (grading), additional opportunities may exist to more significantly impact other components of the teacher planning and student learning processes, though complexity may continue to stymie or slow transitions of other components of these processes.

Finding #5: The increased emphasis on customization impedes potential efficiency gains from full-suite or closed-loop technology systems.

While teachers are using digital instructional tools more frequently today, they are also more likely to customize (i.e., modify purchased materials to make them more relevant to students) their lessons and materials than they were pre-pandemic (Figure 9). The increase in customization was consistent across subjects and grade levels, with a slightly higher increase in elementary grade levels. We observed a more pronounced difference in customization behaviors when considering teachers who were frequent users of technology, both pre-pandemic and today (“experienced users”), vs. those who greatly increased the frequency of usage during the pandemic (“new users”). More specifically, new users reported only a 7-percentage-point jump in likelihood to customize, while experienced users reported a 17-percentage-point jump in likelihood to customize. Both groups seem to have increased customization in response to student need, but those teachers who were already comfortable tech users pre-pandemic demonstrate a strong ability, and likelihood, to customize (Figure 10).

FIGURE 9

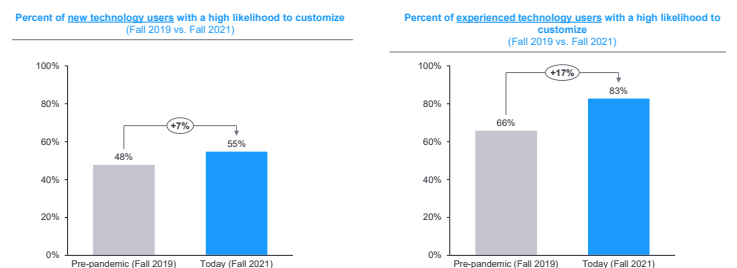


Teachers highlight that much of their increase in customization as they returned to their classrooms in the fall of 2021 is driven by the wider range of abilities and needs of students as they return to in-person learning. As one teacher explained, “I have to create a lot more scaffolding this year because the kids need it. I need to come up with guiding sentences or paragraphs, or find relevant videos for science. [These additional scaffolds] are usually optional but are there for the kids that need it.” Another noted that “I need to increase customization because of the issues that have followed the return to in-person learning. My kids are misbehaving, and many are behind grade level. I need to customize to keep them on track.”

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FIGURE 10




At the same time, customization is also a result of teachers' "cobbling together" the variety of digital tools now available to them which may not readily integrate with each other or be ready to use "off the shelf." A number of interviewees explained how they look across multiple paid and free resources to find lessons and activities for students to augment their core curriculum and post links in their LMS or collaboration platform, like Google Docs. There is a desire for instructional tools to be customizable to fit within a teacher's classroom flow or cater to their students' needs. For example, one teacher explains that "a tool's ability to be customized is important to me. I create a lot of materials on my own, but I also like to be able to adjust the pre-made tools available to me. For example, if I am asking students questions throughout a presentation, I want to be able to add in hints in case they are struggling to answer." Furthermore, teachers frequently stated that they want to provide personalized and individualized learning experiences to students beyond, and on top of, what standard curriculum and purchased content can do in order to make the content more engaging, relevant and interesting to students.

While teachers spend significant time and place emphasis on customizing content and lessons, in doing so they may be sacrificing potential efficiency gains, particularly as it relates to the use of tools and materials with embedded assessment functionality. Among surveyed teachers, the most-used assessment platforms were those that support stand-alone, teacher-created assessments, like Google Forms. These assessments typically do not link directly back to a specific lesson or module in a curriculum product, nor do they identify student skills gaps or present activities that would help students enhance skills and performance. Yet, these are characteristics of assessment products that teachers previously highlighted as critical (Figure 6). This discrepancy is likely driven by the level of customization that teachers are undertaking today: as teachers increasingly customize content, they may struggle to find assessment products aligned to their content or designed for daily use (e.g., where interim/benchmark assessments may be insufficient) and must create their own quick assessments to track student comprehension of the customized materials and student mastery of skills. Given that teacher-created assessments can neither easily track student performance over time nor link back into an instructional feedback loop, usage of assessment data is less prevalent in the planning process today than might be ideal, even though teachers are giving assessments more frequently.



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While greater access to technology and the shift to remote learning pushed many teachers to use digital tools in different ways (or for the first time) and enhanced their ability to collaborate, the plethora of available tools and diverse needs of students have resulted in teachers increasingly customizing their materials. This presents a new tension: customized materials may better meet students where they are but also reduce the efficacy or efficiency of products designed to assess progress or seamlessly integrate with other vendor tools.

A group of students in blue shirts are gathered around a table, focused on a project. In the foreground, a student with dreadlocks is looking intently at a small, white, wheeled robot with a screen on top. Other students are leaning in, some pointing at the robot. The background shows a window with a view of trees.

Frontier 3: Learning transformation

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With the third frontier, the student learning experience is reimagined.

With the third frontier, the student learning experience is reimaged.

While this may take various forms (e.g., student self-paced approach, competency-based learning, flipped classroom model), each provides an experience for students that places them at the center of, and in greater control of, their learning. A different experience for students shapes a very different planning and instructional experience for teachers as well, one in which teachers provide more guidance and support to students but spend less time providing direct instruction to a full classroom. While there are a small number of classrooms and schools that operate in this third frontier, the pandemic does not seem to have significantly increased the number of third-frontier classrooms. While there are certainly more devices and digital tools in schools than ever before, technology penetration alone has not proven sufficient to transform the student learning experience or the instructional approach of most teachers.

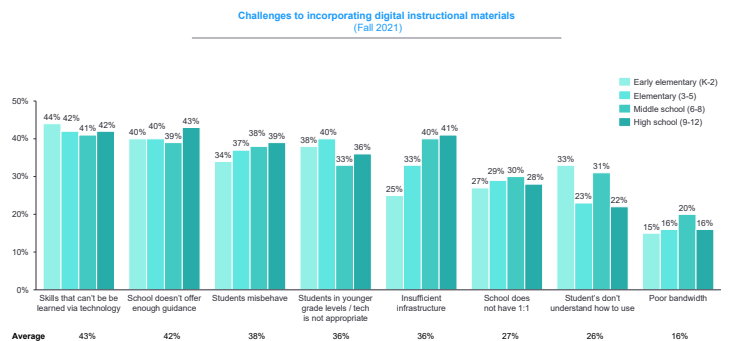
Finding #6: The increased use of technology in classrooms is often impeded by both student behavior and the suitability of technology for certain learning experiences. Notably, infrastructure is no longer frequently cited as an implementation barrier.

Although the data demonstrates a widespread increase in the adoption and use of digital materials, the integration of digital materials in classrooms is not without challenges. Teacher interviews revealed that the highest remaining barrier to technology implementation is perceived to be student maturity, behavior and social emotional concerns. A number of teachers note that many of their students are less mature than is typical for their current grade level and that students remain academically, developmentally and/or socially at the grade level they were in when the pandemic began. As one teacher put it, her “students are hormonally in 4th grade but emotionally in second grade. I have to remember I’m dealing with second graders socially.” Many students require a re-introduction to learning in a communal environment after learning remotely at home, making interactions in the classroom more difficult and requiring teachers to “build in” time for such re-acclimation.

For the current school year 2021-22, teachers highlighted needing to provide more direction and specific instructions for their students than they’d typically expect at that specific grade level. Another teacher remarked that “behaviors are hindering what I would like to do with students. It is a lot more whole-class instruction. When I release students for group work, it doesn’t work, and I have to walk them step by step through activities with a lot more handholding than I would have had to provide previously.” Thus, many teachers are reticent to spend a significant amount of time and energy changing or expanding usage of the technology they’ve already adopted due to fears that the technology may not work for students and could lead to behavior issues. In one conversation, a high school teacher remarked, “For my 12th grade students, I have a lot more trust that we can try out technologies and it won’t be a whole lost cause. To try something with my 9th graders, I need to be prepared to account for the many ways the technology may not work, could disrupt my class, and lead to classroom management issues or other behaviors.”

Survey feedback reveals a few additional considerations that may restrict the proliferation of technology across all classrooms and grade levels. Most notably, about half of teachers across all grade levels acknowledge that there are many skills that may be better taught without technology, such as early literacy, hands-on activities (e.g., science experiments) and interpersonal skills (e.g., conflict resolution). As previously noted, the lack of district guidance also impedes the use of technology in some grade levels. However, it is clear that the infrastructural barriers typically cited pre-COVID-19, such as poor Wi-Fi and lack of devices for students, no longer stand out as the key impediment to the continued growth of technology in the classroom (Figure 11). Devices are present and digital tool usage is high (even if not always fully optimized) today.

FIGURE 11



Finding #7: The proliferation of digital may have led to a more student-centered and individualized learning experience, though questions remain about how to best meet student needs and appropriately balance learning time for students after a year or more of learning outside of a classroom.

The proliferation of digital instructional tools seems to have done little to transform a typical student’s learning experience. In the average classroom, the amount of time dedicated to direct instruction, group work and independent work has remained consistent, even though the instructional tools used look different today than in a pre-COVID-19 classroom (Figure 12).

However, when comparing the classrooms of teachers who are experienced technology users vs. those that more recently adopted more technology, analysis reveals that the increased use of digital instructional materials may also be correlated with an increased amount of independent instructional time in a classroom. Among “experienced technology users,”³ those who used digital instructional products daily, both pre-pandemic and today, the share of independent work (at 36% of instructional time) remained constant. Among “new technology users,”⁴ who began using technology weekly or daily during the pandemic

but were using it less frequently prior, independent work time jumped 7 percentage points, from 28% of instructional time pre-pandemic to 35% today. Thus, in the classrooms of both new and experienced technology users, students spend roughly 35% of their time learning independently today (Figure 13).

For many years pre-COVID-19, the trend in education was toward student-centered, individualized and personalized learning. Data-rich adaptive programs were, and still are, increasingly popular, as are integrated supplemental practice and assessment products, and interim/benchmark products that can identify student skills gaps and recommend remediations. As students return to school in-person, with significant pandemic-related learning loss, there may be a desire to rely on these tools more than ever to both assess student progress and respond to individual student needs. At the same time, students are returning from a period of significant isolation and independent learning during pandemic-driven remote learning and may require different forms of instruction and learning to remediate missed skills or milestones. Thus, teachers and administrators must carefully consider when to leverage the greater range of digital instructional materials and tools that are now available in today’s classrooms, many of which are designed to address the diverse range of learning abilities in an average classroom at an individual level – and when to forego them for different types of learning experiences off-screen.

FIGURE 12

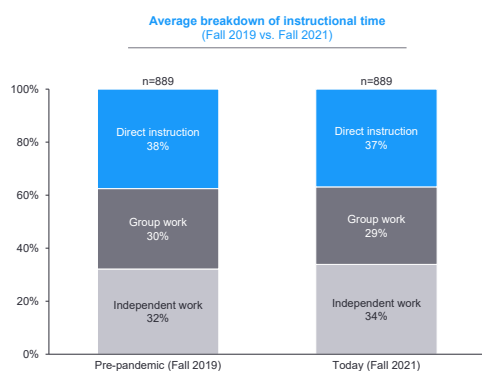
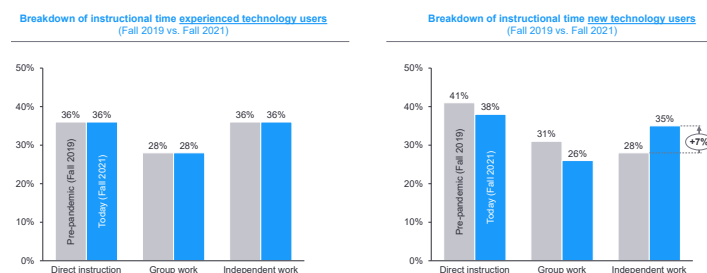


FIGURE 13



³ “Experienced technology users” are defined as teachers who used digital tools daily before the pandemic and continue to use digital products daily today.

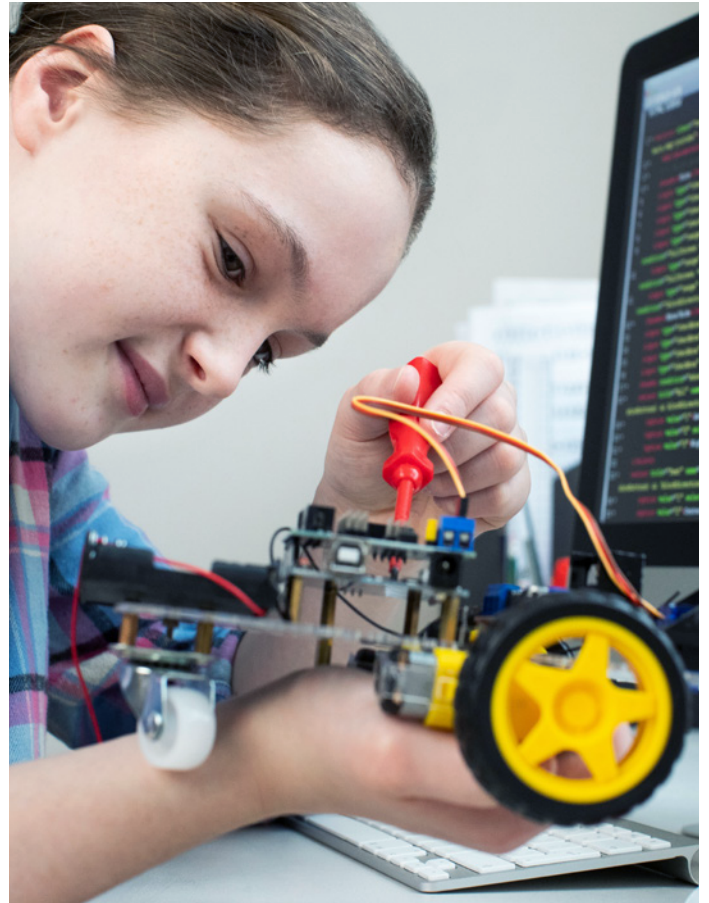
⁴ “New technology users” are defined as teachers who used digital tools never, yearly or less, or every few months before the pandemic to weekly or daily today.

What does a “third-frontier” classroom look like?

Observing teachers in action in their classrooms made the ways that teachers use technology in their workflow and instruction abundantly clear. The vast majority of teachers that we interviewed and observed are using technology for efficiency and collaboration. While only a small minority today are truly using technology to reimagine their approach to pedagogy and transform the learning experience for their students, in these third-frontier classrooms students typically use technology to drive their own learning while teachers are facilitators who oversee a very different classroom experience.

In one ninth grade social studies class, students were engaged in self-paced learning using their teacher’s preplanned materials. The teacher projected the pacing of the overall class on the classroom’s smartboard – both the overall goal to be considered “on track” and each student’s individual progress toward this goal – while circulating to support students as they engaged in prerecorded lectures and mastery checks required to advance to the next lesson. When students were falling behind, multiple safeguards, like teacher check-ins, were in place to help them catch up.

While one may assume that independent, self-paced learning would result in a silent, isolated learning experience, that was not the case in this classroom. Instead, the classroom was an exemplar for the organized chaos that third-frontier learning could look like. Students were working together, supporting one another, and engaging with information at their own pace and in their own style. One student who was ahead of schedule shared, “I wish more of my classes were like this because I actually learn,” while one lagging behind added, “If I need to catch up, I just check in with my teacher.” This classroom conveyed that complex technology is not what powers a third-frontier classroom: in fact, this teacher used only Google Classroom alongside Loom and other Google Suite tools. Instead, it is about shifting the teacher mindset about how diverse learners can find their own paths to success, and ultimately shifting the role of the teacher as the facilitator, not arbiter, of knowledge.



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While the increase in devices and instructional technology removes one barrier to transforming the student learning experience, their presence alone is not sufficient to drive the necessary changes. In many classrooms, teachers spend a significant amount of time grappling with their students’ wider range of needs, which can make it challenging to re-imagine their classroom or teaching approach.

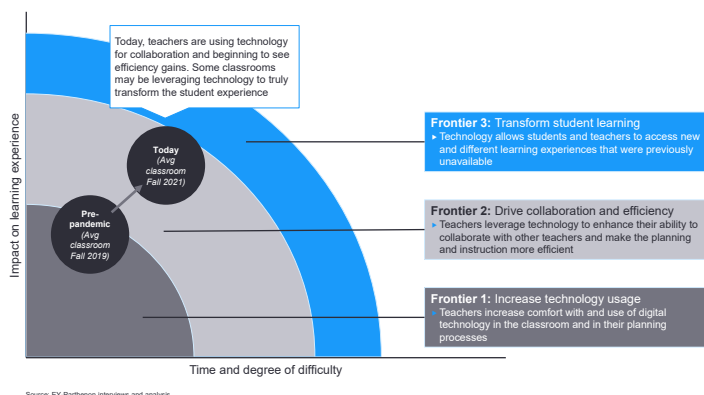
Conclusion

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The dramatic uptick in technology adoption and usage that the pandemic drove pushed many teachers and classrooms beyond Frontier 1 (usage) and into Frontier 2 (efficiency and collaboration gains).

The dramatic uptick in technology adoption and usage that the pandemic drove pushed many teachers and classrooms beyond Frontier 1 (usage) and into Frontier 2 (efficiency and collaboration gains) (Figure 14). While our research suggests that the average classroom today has not been transformed into a student-centered learning experience, there have nevertheless been significant changes, many of which we expect to persist and which may represent key elements of the foundation for future transformation:

FIGURE 14



Technology is embedded into the teacher workflow, and teachers have “voted with their feet” for easy-to-use products:

Teachers rely on Google Classroom (72% of respondents use as LMS) and Google Suite (48% use as a collaboration platform), as the products are perceived to enhance grading efficiency for teachers, have a familiar interface, support ease of integration, and above all, are free, enabling teachers to make their own adoption decisions and easily collaborate with each other. Our research suggests that vendors that integrate well with the suite of Google tools and prioritize teacher ease of use could see success.

Teachers seek tools that help engage students with diverse educational and emotional needs:

Products like Nearpod, PearDeck and Class Dojo are of paramount importance in this period not only because more students have access to devices and are learning digitally than pre-pandemic, but also due to the growing behavior, classroom management and social emotional challenges of students returning to in-person learning. Teachers note that they increasingly seek different modalities, relevant content and a diversity of activities to help them keep students on task as they re-acclimate to in-person learning in a classroom.

Teachers look to their peers, yet they also want more guidance from their districts on how to effectively leverage digital tools:

Teachers were quickly given access to a plethora of digital tools in order to support continued engagement and student learning when schools shifted to remote learning in 2020. In the presence of so much choice, teachers turned to products that were recommended by other teachers, using each other as markers of quality and efficacy in a period when limited guidance was available. Now accustomed to leveraging technology in their instructional workflow and largely back in their classrooms, teachers are seeking more guidance about how to use the tools that their schools and districts have made available to not just engage with students but also to drive learning acceleration and remediation. This suggests that professional learning from districts and vendors that goes beyond “how to sign” to “how to instruct differently” will be important to reaching Frontier 3.

Teachers seek actionable insights to inform daily instruction.

Teachers note that they seek greater integration between content and assessment today, highlighting a need for assessment products that provide data-rich and actionable insights aligned to student learning goals, skills gaps or even specific content. To get this information on a daily basis, they are customizing and adapting content even though this has necessitated the substantial use of teacher-created assessments to align to tailored content. Looking forward, there is likely a need for increased connection between content and assessment to inform daily instructional planning, but teacher sentiment will be an essential input into the design of any effective – and widely used – assessment platform and feedback loop.

Given the uncertainty that remains after nearly two years of this ongoing pandemic, we find ourselves with many unanswered questions. Five of the most pressing questions that we are continuing to explore as we support schools, districts and their partners to move toward the next level are:

1

As teachers spend more time with digital materials, what additional efficiencies will they gain, and how will those efficiencies enhance the teacher experience more broadly?

2

Going forward, what is the “right” balance of flexibility and customizability in instructional materials and assessment products?

3

How do flexibility and customizability impact the flow and integration of data required to achieve the full feedback loop that teachers and administrators are seeking?

4

How can districts support teachers and vendors to continue to invest in student academic progress (e.g., reviewing assessment data, personalizing instruction) while also supporting the students’ social emotional and mental health needs after two years of COVID-19-disrupted learning?

5

How is the increased use of devices and digital instructional materials impacting student learning, social emotional health and classroom camaraderie?

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