THE CONNECTED LEARNING ERA:

MITIGATING THE IMPACT OF COVID-19

Research-based practices for teaching and learning

A MESSAGE FROM JACK LYNCH,
HMH CEO

The COVID-19 pandemic has created extreme disruption and extraordinary circumstances for educators, students, and families.

Still, we have seen amazing examples of strength, dedication, and passion in the K–12 space—teachers and students bringing the classroom online and navigating new, and often imperfect, systems to connect with one another, and communities working tirelessly to ensure children are safe, fed, and emotionally supported.

While educators frequently grapple with the "summer slide" during the back-to-school season, the impact of this pandemic has led to an urgent imperative that needs our attention now. Of critical importance, the disruptions from this past year will have a greater negative impact on students from high-need communities and those with special needs.

HOW DO WE MOVE FORWARD?

The current moment has hastened the arrival of the virtual classroom. Online learning now seems essential and nondiscretionary. Whereas "blended" teaching and learning was the 2010s, "connected" teaching and learning will be the 2020s.

At HMH, our focus on "connected" teaching and learning is rooted not simply in the fact that educators must now be fluent in online teaching. The pandemic has drawn much-needed attention to a major social injustice, shifting the ground beneath policy makers and school leaders with a new, central K–12 priority—to bridge the digital divide and provide all students with access to a device and to the internet.

THE ENTIRE TEACHING AND LEARNING COMMUNITY NEEDS TO BE CONNECTED—NOT AS AN ASPIRATION BUT AS A NECESSITY.

Technology will propel us forward on this path, but "connected" learning is rooted in both the structures and culture of our learning systems. Our go-forward approach should be woven from digital solutions, but we need to think holistically about how we connect the entire education infrastructure and how it can continue to evolve in service of support for all learners. This includes people, support systems, digital platforms, policies, and more.

Since the onset of school closures, the team at HMH has partnered with the learning communities we serve, which are made up of a constellation of teachers, school leaders, students, families, school staff, and caregivers, to provide the right support and address these unique challenges. In the report that follows, you will find concrete recommendations from our learning scientists and researchers to assist you in planning for the upcoming school year, with a focus on a connected vision for teaching and learning.

As we enter this new era together, I thank you for all you do for your learning community and for your commitment to building a future for the K–12 space that honors the relationships at the heart of education.

Jack Lynch
President and Chief Executive Officer

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INTRODUCTION

Looking forward to the future, educators are reimagining the structure and culture of their schools and districts to establish a new connected learning environment that serves all students. *The Connected Learning Era: Mitigating the Impact of COVID-19* is offered as a resource by HMH® summarizing "what works" in connecting educational technology with teaching and learning in both virtual and in-person classrooms. This will help answer important questions: How can we simultaneously promote students' well-being and accelerate their learning? How can we help educators adjust to teaching and learning in an at-home, online, remote, or virtual environment?[1] How will we meet unprecedented and unpredictable challenges?

This guide lays out what the research says about teaching and learning in various settings, points out what is important to consider when teaching is not in person, and provides suggestions for building the structure and culture needed to assist educators who are dealing with the most significant challenge of our time—educating a generation of learners in the middle of a crisis that will impact the rest of their lives.

As we reflect on the interrupted schooling that COVID-19 has caused and make plans to move forward, what do we call this emergency schooling? We propose that a new term— **connected learning**—is needed, which combines the best from in-person, virtual, remote, distance, and online learning to move beyond short-term fixes to long-term solutions.

Here is what the research says about what students might need and what our proposed **Connected Learning Model** can provide to better support educators and teachers starting now. Let's get through this together.

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[1]There are many terms to describe spring 2020 learning. For this paper, the location of the student in spring 2020 is an example of "at-home," logging in to a school conference call is an example of "remote," using a digital program is an example of "online," and an environment that houses materials (e.g., Google Classroom™ or Flipgrid) is an example of "virtual."

WHAT THE RESEARCH SAYS ABOUT INTERRUPTED SCHOOLING AND LEARNING LOSS

Previous research has examined learning loss that results from interrupted schooling during summer break, a lack of formal schooling for refugees and English learners (ELs), chronic absenteeism, and crises and trauma. Our most vulnerable students—with special needs, from communities of poverty, and minority students—are often most impacted by interrupted schooling. While it is impossible to predict the exact impact COVID-19 will have on individual students' learning, we can learn from and prepare for the challenges ahead by examining this body of research.

▶ **SUMMER LEARNING LOSS**

During the summer months when students are out of school, educators often witness what is referred to as "summer learning loss," when students' academic achievement at the start of the new school year in the fall is lower than it was at the end of the previous school year. There are three issues educators are most concerned with pertaining to summer learning loss (Cooper, 2003):

1. **Negative effects on student achievement**

   The long summer vacation breaks the rhythm of instruction, leads to forgetting, and requires a significant amount of review of material when students return to school in the fall. Typically, summer learning loss equates to 1—2 months of reading instruction and 1—3 months of math instruction (Kuhfeld, 2019). Summer loss is more pronounced for math facts and spelling than for other tested skill areas given that, without practice, facts and procedural skills are most susceptible to forgetting (Cooper et al., 1996).

2. **Greater negative effect on students with special needs**

   The long summer break can have a greater negative effect on the long-term learning of children with special educational needs. One study suggests that students with reading difficulties (RD) have a greater decline in reading skills than do non-RD students over the summer vacation (Menard & Wilson, 2014).

3. **Greater impact on low-SES, minority, and younger students**

   Higher socioeconomic status (SES) students may return to school in the fall with a considerable educational advantage over their less-advantaged peers as a result of additional school-related learning and greater exposure to books over the summer months (Cooper, 2003). Additionally, an analysis of nationally representative longitudinal data indicates that the achievement gaps between racial and SES groups are present at the start of kindergarten, suggesting the family environment outside of school is the primary source of early achievement gaps in reading and math skills. Notably, between kindergarten and second grade, variance in reading and math scores shrank over the school year but grew during the summer months, suggesting that schools reduce the achievement gap during the school year but that the effect is lessened or lost over the summer (von Hippel et al., 2018).

ENGLISH LEARNERS WITH INTERRUPTED SCHOOLING

Many immigrant students who arrive in the United States have experienced either significant gaps in their formal education or have not received any formal education at all due to circumstances such as living in refugee camps, war-torn countries, or conditions of extreme poverty (Custodio, 2011). Many of these students are also ELs, and thus face the difficult task of needing to learn academic English while also learning age-appropriate academic content (Suarez-Orozco et al., 2011). More than 1 in 10 (11.4%) foreign-born students arrive in the United States having experienced interrupted schooling, and these students are on average about two grade levels behind their peers in academic skills upon arrival in the United States (Potochnick, 2018). Analyses of test scores showed that, compared to their peers, immigrant students with interrupted schooling scored 11% lower in reading and 16% lower in math. Results from another study found that an estimated 70% of refugee students drop out of school (Gunderson, 2007).

CHRONIC ABSENCES

Researchers generally define "chronically absent" as missing at least 10% of school days, equivalent to 18 absences per year or 2–3 absences per month (Balfanz & Byrnes, 2012). Absence rates are higher among low-SES students, and the impact is compounded by the fact that their households are less able to compensate for lost instruction (Morrissey et al., 2014). Gershenson and colleagues (2017) found that chronic absences are associated with significantly lower levels of reading and math achievement in urban, suburban, and rural schools, estimating that reducing low-SES students' absences by 10 days would reduce the achievement gap by up to 10%.

## EFFECTS OF CRISES AND COLLECTIVE TRAUMA

Situations stemming from natural disasters and regional crises also significantly affect learning and teaching. Hurricane Katrina closed most public schools in New Orleans for the entire fall term of 2005. When researchers tracked students as they returned to New Orleans and re-enrolled in newly reorganized schools, they found that students took two full school years—from the spring of 2006 to the spring of 2008—to fully recover their lost learning (Harris & Larsen, 2019). Additionally, they noted that there was "suggestive evidence" that the negative impact was worse for low income and African American students. Researchers also noted that the negative impact was not only on students' academic learning, but on students' emotional well-being as well (Harris & Larsen, 2019).

The effects were not limited to students, as the school district dismissed all employees as part of its reorganization process. By 2013, only 37% of those educators who had worked in New Orleans prior to Katrina were still employed in Louisiana public schools (Lincove, et al., 2017). Currently, many educators dealing with the COVID-19 crisis reported extremely high levels of stress during the transition to a virtual classroom as they did not immediately know what was expected of them (Schwartz, 2020).

▶ EFFECTS OF ECONOMIC RECESSIONS

One historical factor in the rise and fall of standardized test scores is the financial health of the United States (Shores & Steinberg, 2019). During the economic boom of the 1990s and early 2000s, the gaps in test scores between the highest and lowest performing students decreased. Conversely, the economic fallout of the 2008 recession indirectly led to a subsequent drop in test scores. For example, from 1990 to 2000, NAEP scores for fourth grade math steadily increased and the rate of increase for the lowest 10th percentile was greater than the highest 10th percentile, leaving the gap between the top and bottom 10% of students 9 points smaller. During the last decade that progress has been erased—the top 10th percentile has a slightly higher average score and the bottom 10th percentile has a lower average score, increasing the gap between them by 8 points (Figure 1). Given the economic impact of COVID-19 on the U.S. economy, without intervention there is a strong likelihood that this gap will continue to grow.

FIGURE 1. Grade 4 NAEP Math Scores: Average Achievement Gap between the Top 90th Percentile and Bottom 10th Percentile before and after the 2008 Recession
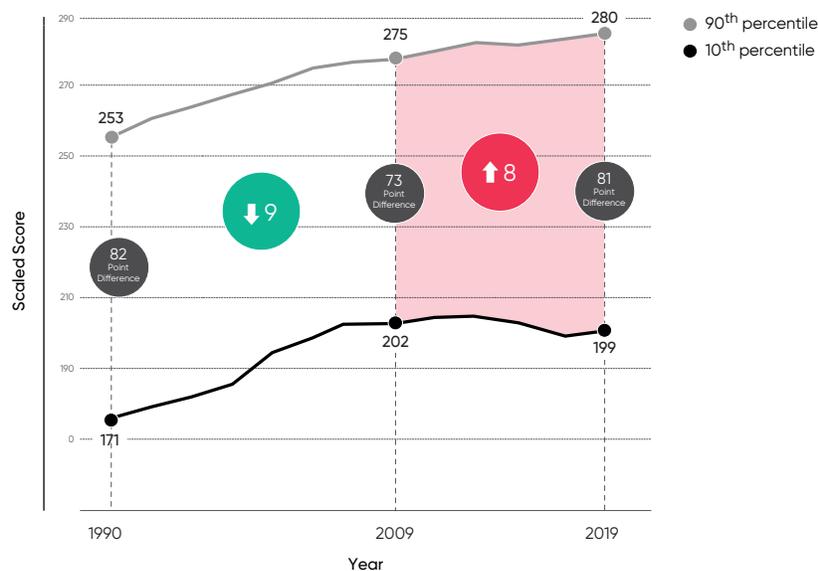
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), various years, 1990–2019 Mathematics and Reading Assessments.

If continued interruptions to schooling and an economic recession result in longer school days, increased class sizes or radically different class structures, reductions in new hires, and the elimination of support staff, which are prominent reasons why educators leave the profession (Sutcher et al., 2016), many educators may decide to retire or change careers.

When individuals have experienced trauma, they may retreat and have a difficult time opening up. To help them, consider:

- Establishing a trusting relationship;
- Providing opportunities to talk, ask questions, or express themselves through writing, art, or other media; and
- Being alert to physical reactions such as fatigue, trouble concentrating, sleeping, or eating difficulties, or physical complaints.

A CONNECTED LEARNING MODEL TO STRENGTHEN LEARNING

Leading into this new era of connected learning requires school leaders, educators, families, and communities to support the well-being and academic growth of students. When systems, tools, and people work together, they set up an effective and cohesive **structure** to enable the **Connected Learning Model** (Figure 2). The model includes five key phases: notice and empathize, assess to identify learner needs, use data to inform decisions, leverage high-quality curricula and learning sciences to accelerate academic growth, and reflect for continuous improvement.

School leaders help to establish a **culture** that enables students, families, and teachers to have agency and take advantage of what the structure provides. Connected learning is enabled by a culture that prioritizes social and emotional well-being, supports professional learning, and includes family and community engagement. School structures and cultures will need to pivot to include new tools and processes that we haven't yet perfected. All of us will be engaging in equity-related and human-centered design thinking. A design-thinking mindset of continuous improvement will reduce the stress of needing to get it right the first time, not just for the students and their academic growth, but for everyone who is part of the connected learning community.

This guide will describe the elements of the Connected Learning Model, presenting evidence based practices that can support rigorous, intensive, motivating, and personalized connected learning. It includes specific recommendations on how best to adjust and apply teaching and learning that happens from home—ensuring that all students thrive, and achievement is accelerated to help shorten the duration of the negative effects from interrupted schooling due to COVID-19.

FIGURE 2. The Connected Learning Model
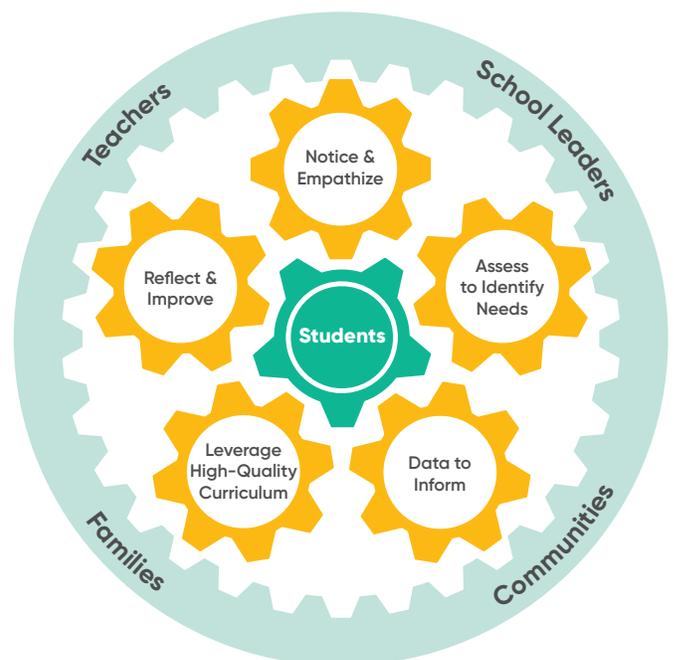
NOTICE AND EMPATHIZE WITH SOCIAL AND EMOTIONAL LEARNING (SEL)

The Connected Learning Model begins with intentionally cultivating a caring and equitable learning environment and evidence-based practices that actively involve all students in their social, emotional, and academic growth. As the pandemic has caused stress, grief, loss, and anxiety about the future for many families, it is now more urgent than ever to notice, empathize, and address the impact these factors have on students' social and emotional well-being and, ultimately, on their academic learning.

Even before the current crisis, educators were increasingly focused on students' social and emotional needs (Twenge et al., 2019). In a survey conducted with over a thousand educators (Houghton Mifflin Harcourt & YouGov, 2019), 75% of educators and school leaders noted that their top concern was how to address the increasing social and emotional needs of students. Research has demonstrated that attending to students' SEL is crucial not only to enhance students' well-being but also to increase students' academic achievement (Durlak et al., 2011; Taylor et al., 2017).

School leaders, educators, and families can support a systemic and connected approach to learning by nurturing the whole child and infusing social and emotional learning into every part of students' daily lives—across their classrooms, during all times of the school day, and when they are in their homes and communities. The practice of **cultural responsiveness** starts with noticing our own biases and building relational trust with students by honoring their stories and listening for their emotions (National Equity Project, 2020).

Conducting a **needs assessment** for social and emotional learning for students and educators, in addition to understanding families' home environment, can help schools and districts understand how best to provide and allocate resources to support the challenges they may have faced while schools were closed. It is crucial to identify and build on the strengths yet pinpoint and nurture the areas that need attention. Leaders can use an evidence-based SEL framework and strategies listed below to help guide their educators' instructional practices and empower their students through care, compassion, and explicit instruction of SEL competencies.

▶ SOCIAL AND EMOTIONAL LEARNING SKILLS AND COMPETENCIES

The Collaborative for Academic, Social, Emotional Learning (CASEL) provides an SEL framework that considers a research-based systemic approach to social and emotional development (Figure 3). Within the CASEL framework are five core SEL competencies that are supported across classrooms, schools, families, and the wider community: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (CASEL, 2020).

FIGURE 3. The CASEL Social and Emotional Learning Framework
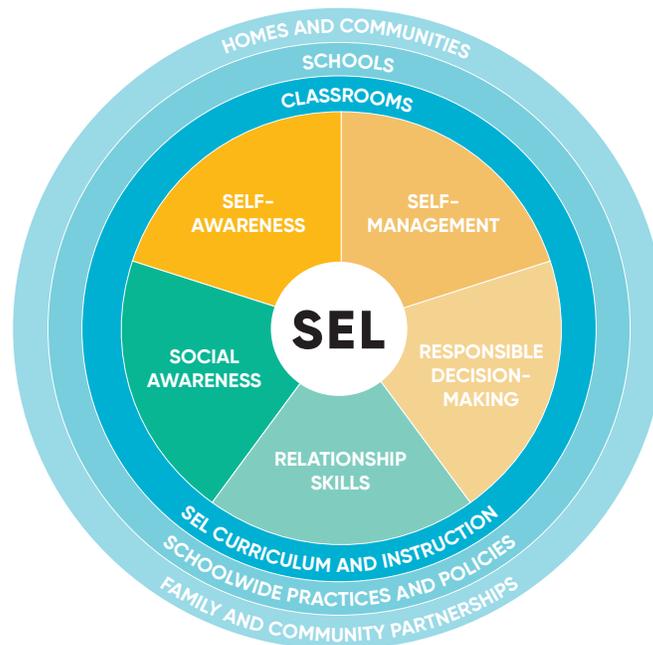
▶ SELF-AWARENESS

Self-awareness is the ability to recognize and label one's emotions, to recognize strengths, and to build skills related to confidence and self-efficacy (CASEL, 2020). When individuals are experiencing stress and anxiety, it is difficult for them to focus and pay attention, keep their emotions under control, or handle frustration in an appropriate manner. Providing individuals the opportunity to reflect on their experiences and accurately identify their feelings is essential. By starting the interaction with **"How are you?"**, educators will demonstrate that they are putting the well-being of their students first and allow them to share their feelings in these uncertain times. Examples of self-awareness activities include:

- Discussing age-appropriate physical and emotional cues of a particular feeling or emotion;
- Asking students to brainstorm age-appropriate things they can do to improve the way they feel (e.g., ask my mommy for a hug, talk to a friend, listen to upbeat music); and
- Reflecting and writing in journals (CASEL, 2017).

▶ SELF-MANAGEMENT

Being aware of one's emotional state and social surroundings is needed to regulate one's actions, thoughts, and emotions in any situation or environment. Self-management includes skills such as impulse control, stress management, self-motivation, perseverance, goal setting, and organizational skills (CASEL, 2020). As students have experienced collective trauma through the pandemic, misbehaviors and lack of **self-regulation** from prolonged physical isolation may be more noticeable. Rather than initially punishing the students because of their misbehavior, understanding and identifying the cause of the emotion may help students overcome the behavior and form a stronger bond with the teacher when the student feels cared for rather than judged. Examples of self-management activities include:

- Teaching effective stress management techniques (e.g., deep breathing, yoga, positive self-talk);
- Establishing a separate space in the classroom for individual self-management (e.g., reading corner, peace corner);
- Acknowledging and praising students for positive self-management;
- Communicating the routine and setting clear expectations;
- Reviewing self-regulation skills: managing their time, organizing their materials, and staying on task (CASEL, 2017).

Stress management is not only important for students but for teachers, school leaders, and family members alike. Research findings show that educators' emotional states affect students' learning and student outcomes (Oberle & Schonert-Reichl, 2016) and that educators are more effective when they are less stressed (Sparks, 2017). **Practicing self-care** and maintaining one's own positive well-being are essential as educators model those behaviors to their students and peers. Just as teachers are focusing on the social and emotional well-being of their students, school and district leaders are also developing the social and emotional well-being of their staff.

▶ SOCIAL AWARENESS

Social awareness is the ability to consider multiple perspectives and appreciate those from diverse backgrounds and cultures. It includes having empathy for others, possessing the ability to understand social and ethical norms for behavior, and showing respect for others (CASEL, 2020). Particularly during these challenging times of anxiety and uncertainty, listening to each other's experiences and showing empathy toward others helps bring communities together. It is important to understand and acknowledge that one's experience of the pandemic may greatly differ from another's and that we each have unique stories to share while collectively experiencing a common trauma. **Promoting respect for all** rather than harboring discriminatory thoughts and behaviors is essential for the educator to model and for all to exercise in daily interactions. Examples of social awareness activities include:

- Talking about how others may feel in different situations,
- Celebrating diversity in the class,
- Empathizing with those in need and showing care for others' well-being, and
- Finding ways to help others.

▶ RESPONSIBLE DECISION-MAKING

Responsible decision-making centers on the individual's ability to make respectful and constructive decisions around issues related to the self and in social situations in everyday life (CASEL, 2020). When students or educators encounter another who is struggling academically, socially, or emotionally, how can they best support that person? How should each of us behave during times of crisis to minimize its impact and support community values? Other aspects of this SEL competency include identifying potential issues, analyzing situations, and solving problems. By reinforcing responsible decision-making in learning environments, students will make better decisions about their own learning and be able to take more control over their learning. These skills can transfer to making better decisions in day-to-day life. Examples of decision-making activities include:

- Giving students real-life problem scenarios and asking what they would do,
- Acknowledging the complexity of making decisions and that we may not always make the best decisions all the time, and
- Being a confidante for the students when they need to make a difficult decision.

▶ RELATIONSHIP SKILLS

A sense of belonging in the school and classroom is essential to students' feelings of comfort and readiness to learn. Creating bonds with peers, educators, and others at school and feelings of school belonging are also key factors in preventing misconduct (Demanet & Van Houtte, 2011). Whether online or in person, promoting a sense of belonging and connection **leads to happier and more engaged learners**. For example, beginning the day or class by asking a question of the day or week, either in a synchronous videoconference setting or by posting it online, leads to sharing of interests and community values. Teachers and leaders collaboratively create an environment where all students feel like they fit, they are safe, and they can continue to grow and learn.

Building and strengthening the relationships that students form with teachers, as well as each other, plays an important role in students' motivation in online and in-person learning environments (DiPietro et al., 2010). In positive relationships that are built on **mutual feelings of care, trust, and safety,** students' emotional well-being, positive sense of self, and social and academic skills are promoted (Martin & Dowson, 2009). Encourage teachers to hold office hours to provide a safe haven for students to discuss their feelings. Schedule one-on-one check-ins with each student (and with each teacher, for they need check-ins too)— especially those that may be exhibiting depression, stress, and/or anxiety issues.

Additionally, build and deepen relationships between educators and mental health professionals within and outside the school. As a school or district, prioritize investments in social workers, guidance counselors, and psychologists when possible. Educators can serve as liaisons with healthcare professionals to identify those students who may need additional follow-up counseling support. Other examples of building relationships include:

- Creating opportunities for social connections in and out of school,
- Scheduling a fun activity each day,
- Expressing gratitude toward others, and
- Having the courage to ask for help.

All five SEL skills and competencies can be both integrated with academics and worked on separately as students' and educators' needs arise. Educators can explicitly model these behaviors, integrate the strategies into lessons, and provide opportunities for practice during whole-group, small-group, or individual instruction time.

Equally important, provide spaces and times to talk about COVID-19 at an age-appropriate level; **becoming knowledgeable with appropriate facts may lessen the fear**. For younger students, keep the explanations brief and simple, discuss proper handwashing techniques, or think of ways to show gratitude to the essential workers. For older students, inform them how to differentiate facts from fiction/rumors (News Literacy Project, 2020). For adults, connect about health, safety, and updates in policies to stay informed.

By being responsive to the social and emotional needs of students, teachers, staff, and families during these periods of school closings and in the months after schools reopen, leaders can establish a collaborative process to build a coherent and connected vision for learning. A connected structure and culture will help teachers know what is expected of them, how to deliver effective instruction under difficult circumstances, and how they can get support when they need it. By focusing on the culture of the school and the well-being of their staff, schools may be able to mitigate some teacher turnover while still preparing for the possibility that some teachers won't return to the classroom.

▶ **FAMILY ENGAGEMENT**

Families are more engaged in their children's learning than ever before and, in many cases, have a new-found respect for the work of educators and schools. The respect is reciprocated as educators appreciate all that families are doing to support learning at home. One of the silver linings of this crisis is that it can allow educators and school leaders to create new and strengthen existing family and community partnerships that will benefit students now and in the future. Over the next school year, district and school leaders can build up and lean on these relationships to ensure that students' learning will continue even if schooling interruptions extend into the next academic year. Actions that schools and districts take now to develop these relationships will reduce the burden on families and support long-term learning. Schools and districts can focus on regular communications to families that are focused on connection and appreciation to help foster family engagement.

▶ FAMILIES AS CRITICAL LEARNING PARTNERS

Schools and districts that successfully engage families in their children's learning are able to strike a balance between encouraging families to support learning and pulling the families into the school community. These schools view families as partners in their children's education and provide a collaborative environment that builds relationships between educators and families. They have frameworks that encourage both learning at home and collaborative decision-making (Henderson et al., 2007).

In a connected learning environment, support from the families is even more critical in ensuring students' academic success. **Schools need to help families support the students, particularly the younger ones**, to attend online classes, submit assignments in a timely fashion, and ensure that all the technology at home supports the mode of learning selected by the school.

▶ MODIFYING COMMUNICATIONS TO FIT FAMILY NEEDS

Establishing a consistent method of communication with the families is essential in building and maintaining this partnership. Once schools develop students' learning plans, they need to clearly communicate them with the families in a concise and comprehensive way so that everyone knows what is required vs. optional, why it is important, and where they can get support when needed. Partner with local mental health agencies that specialize in supporting parents during times of stress by serving as a source of communication with information about hotlines, resources, and community support systems.

For families who do not speak English, schools need to consider providing letters written in the families' home language, if possible. Many instructional digital programs embed Spanish supports and other languages into the software. Highlighting these key components of instruction and explicitly communicating the instructional goals in the families' native language are important to maintain equity in the opportunity to learn.

▶ DEVELOPING COMMUNITY STRATEGIES THAT SUPPORT ATTENDANCE

Truancy, or school absenteeism, is an issue that significantly impacts student outcomes. Family support in ensuring that students attend school in person and complete online activities is essential. It is easier for students not to "show up" to an online class and not to complete assignments when the accountability of the physical presence of the teacher is removed. Engage with the families by bringing them into the school community's strategy system that includes ownership or responsibility. Engage with families by providing tools and techniques for getting students to "attend" virtually and in person.

Provide feedback to families and more assistance when needed. For families who need more help, use multiple methods and tools to keep trying to establish engagement. Even when families do not respond right away, continually reaching out will demonstrate your effort to support them.

ASSESS TO
IDENTIFY NEEDS

A Connected Learning Model uses assessment data to drive instructional decision-making and accelerate learning. Assessment is **"the bridge between teaching and learning"** that provides insight into the impact of instruction and guidance on determining instructional next steps (Wiliam, 2014). The value of the insights that educational assessments provide are balanced against the time and effort required to administer them, especially when maximizing instructional time is of utmost importance. An assessment system that's informative and feasible is:

- Comprehensive, providing different measures for different purposes and multiple ways for students to demonstrate their knowledge, skills, and abilities;
- Coherent, grounded in a unified theory of development and connected to the curriculum (Lane and Stone, 2005);
- Continuous, providing frequently updated information that enables timely feedback and differentiation (Pellegrino, 2014); and
- Valid for its intended purpose, reliable enough to ensure consistent results, and developmentally appropriate in order for students to demonstrate their knowledge, skills, and abilities.

With the delays of large-scale, high-stakes assessments, or what Wiliam (2011) calls "**assessment of learning**," that provide summative information about students' mastery of the previous year's standards, educators will increasingly need to leverage a variety of formative assessment options ("**assessment for learning**") to obtain data that can inform instruction.

A comprehensive portfolio of assessments, including summative and formative (both formal and informal) provides multiple opportunities for students to demonstrate their understanding and teachers to gain valuable feedback. Formative assessments provide the most actionable data for teachers when they explicitly and systematically connect with the developmental progression outlined by the curriculum, and when they are frequently administered to provide a continuously updated flow of information. Although these forms of assessment are not new, their implementation and integration will be paramount in determining where students are during and after this period of school disruption and what they need in terms of instruction.

Using Ongoing Assessment to Understand and Close Skill Gaps

Formative assessments can be formal—moderated, standardized, systematic, and studied to determine their reliability and validity—or informal—focused on observation of student work (Shute & Kim, 2014):

Formal Examples	Timing	Purpose
Benchmark (BM) or interim	Beginning of year and then every 6-8 weeks or at middle and end of year	• Administer to all students • Establish baseline • Evaluate growth • Flag for additional support or testing • Create small groups
Progress Monitoring (PM)	Between benchmark assessments, bi-weekly/monthly	• Administer to students receiving additional support • Quick and skill focused • Evaluate impact of support to make adjustments • Create temporary small groups

Informal Examples	Timing	Purpose
Quizzes, unit tests, exit tickets, homework, long-term projects	Frequent, varies depending on assessment, daily/weekly /monthly	• Check on lesson retention • Allow for collaboration • Demonstrate higher-order thinking skills and integration of concepts • Contribute to a portfolio of work
Interactive classroom activities, classroom discussions, observations	Frequent, during instruction, daily	• Determine need for review • Check on understanding • Address misconceptions in the moment

▶ **IMPLEMENTING ASSESSMENT WITH CONNECTED LEARNING**

Assessment may be happening online or with traditional paper and pencil, with or without proctoring, separate from teaching or during teaching. The following considerations can be modified for educator and student needs.

▶ **ASSESSING SEPARATE FROM TEACHING**

- Use online BM/PM assessments with students who can work independently. For students where these would not be appropriate, using video or phone conferencing as part of a face-to-face assessment interaction helps ensure they understand the task and stay focused and motivated.
- When interpreting results from timed observational assessments, consider that remote administration may slow response time.
- Compare results to previous, classroom-based administrations as another check on students' ability to demonstrate proficiency with the type of assessment assigned—a decline in scores may indicate issues with the mode of administration (e.g., online versus paper and pencil) rather than a decline in their ability.
- For students without internet connection or those who cannot work independently online, provide students with printed versions and ask families to text photos of their work or provide options for dropping off completing work.

▶ **ASSESSMENT WHILE TEACHING: PREPARE, PROBE, DIAGNOSE, RESPOND**

- **Prepare:** Start with a clear set of learning objectives to assess.
- **Probe:** Determine a set of probes you will use to elicit responses related to the learning objectives during your online lesson.
- **Diagnose:** Determine student understanding through their responses to the probe. During online lessons, use quiz tools or have students hold up signs to answer recall questions to encourage retention, check for understanding, and provide immediate feedback to students who are confused.
- **Respond:** During online lessons use common misconceptions to aid in your understanding of deficits.

▶ **ASSESSMENTS AS FEEDBACK**

- Share family-directed reports that include acknowledgement, encouragement, and recommendations with families so they understand their students' strengths and needs and can facilitate a more active partnership in teaching.
- Return student work with specific feedback as to what students are doing well and how they can continue to make progress. For students who cannot yet read, audio memos can help share feedback and encouragement.
- For longer-term projects, ask students to plan and track work in a graphic organizer they can frequently update and share with you, attend group meetings using video or phone conferencing to monitor progress, provide guidance, and observe the development of collaborative skills against a rubric. Plan an online sharing session to present finished work. If a live session is not possible, celebrate success by sending students pictures or copies of their classmates' work.

As educators work toward solutions for providing connected learning, similar challenges need to be addressed with assessment. Most assessments, especially higher-stakes assessments, take place in relatively standardized conditions under the observation of

a proctor such as a teacher to help ensure that the test results reflect the ability of the student being tested (e.g., by eliminating outside distractions and reducing opportunities to cheat). The **dynamics of an assessment system will need to adapt** when students are participating in a virtual classroom. Reducing the constraints that typically ensure standardized conditions will place a greater burden on families (e.g., to provide a quiet environment and ensure outside help isn't provided) and on test development experts to offset the loss of standardization while still designing assessments that produce instructionally relevant data to support decision-making. Additionally, the topic of fairness in remote assessments for students with disabilities (e.g., IEPs and 504 plans) will need to be addressed. These challenges can be met by leveraging the technological capabilities that a virtual classroom affords. Online testing systems will be relied upon to impose constraints to maintain the reliability and validity of the assessment results while offering the ability to expand on item formats, simulations, and automated scoring.

Using Data to Support the Needs of Students, Educators, and Families

In applying the Connected Learning Model, it is important to differentiate the type, level, and intensity of support to match the needs of **individuals and groups**. A useful approach to determine the level of required support is to begin with initial screeners (e.g., quick, well-designed assessments, designed for specific purposes), followed by ongoing assessment throughout connected learning. For example, the leveled support approach below adapts the Multiple-Tiered Systems of Support (MTSS) framework to provide clear structure when supporting students, educators, and families (National Center on Response to Intervention, 2010). It is important to note that when most students have a similar level of need, the Level 1 support for all students needs to match that higher level of intensity.

- **Level 1—All Students:** Designed to be delivered to all students, Level 1 support includes high-quality curriculum, content, and instruction. All too often, students who are struggling in particular content areas are unfortunately denied the opportunity to participate in the grade-level curriculum and learning opportunities. Instead, implement grade level core curriculum that allows for additional support for students who are performing below grade level and extensions for students performing above grade level. Within Level 1, support for all is differentiated based on need, experience, and background. Level 1 support is sufficient for about 70% of learners and includes differentiation to meet the needs of those who will benefit from additional support or more challenging opportunities through supplements delivered to the whole group, in small groups, and one-on-one.

- **Level 2—Subset of Students:** Typically, about 15% of learners require additional support or interventions. Using data-driven informed decision-making, Level 2 support is more intensive than Level 1. It is strategic support that is explicit, intentional, delivered in small groups or one-on-one, and customized to meet the learners' needs, which have been identified through high-quality assessments.

- **Level 3—Exceptional Students:** A very small percentage of students (typically about 5%) will require highly intentional and highly intensive support when their identified needs have not been met through Level 1 or Level 2 support. Level 3 support delivered one-on-one or in very small groups, is highly customized for students based on identified needs. This level applies to students who are at both ends of the achievement spectrum: the lowest performing and the highest performing.

USE DATA TO INFORM DECISION-MAKING

After assessing students to inform teachers of their relative strengths and weaknesses, the teachers can use the data gathered to plan a connected approach to instruction that integrates effective strategies from learning sciences. This approach will need to be differentiated across students' interests and abilities in whole groups, small groups, and individual instruction and practice.

▶ DIFFERENTIATING INSTRUCTION TO MEET THE NEEDS OF ALL LEARNERS

Many students will experience gaps in their knowledge and skills. This unprecedented situation means that all teachers will need to focus on filling their students' individualized gaps, and research says that deliberate practice is a powerful way to address this need. The greatest learning gains happen when teachers engage students in deliberate practice targeted to the skills they need to work on (Connor, 2019). Deliberate practice is a systematic and purposeful approach to learning that builds toward a learner's specific goals by identifying and incrementally improving targeted aspects of performance through expert guidance, feedback, and tasks that are just outside of the learner's current capacity (Ericsson & Pool, 2016), also known as their zone of proximal development (Vygotsky, 1978). Because **deliberate practice is tailored to the needs of the individual student** (or groups of students with similar needs), it requires teachers to differentiate instruction for each student's abilities, interests, and aptitudes (Tomlinson & Cooper, 2006; Tomlinson, 2014).

Responsive differentiated instruction that meets students where they currently are and adapts to their needs will be critical to ensure all students can regain lost ground and is dependent on skilled and knowledgeable educators (Tsai & Hsu, 2007). Teachers benefit from having **deep knowledge of both the subject they teach and the characteristics of each of their students** that are relevant to instructional planning, derived both from formative assessment data and personal knowledge of the student's interests and preferences (Valiandes, 2015). As Hattie (2012) notes, "Differentiation relates more to addressing students' different phases of learning from novice to capable to proficient rather than merely providing different activities to different (groups of) students." Equipped with an understanding of individual student needs and preferences based on both quantitative assessment data and observations of student behavior, teachers can differentiate instruction by:
- Content—the skills or knowledge that is the focus of instruction, or the way content is accessed,
- Process—the way students interact with the content, and
- Product—the way students demonstrate knowledge and skills (Sousa & Tomlinson, 2018).

As Shanahan (2018) points out, to be efficient, not all instruction should be differentiated—a **mix of whole-class, small-group, and individualized instruction** allows teachers to address both common and individual needs of their students flexibly.

Whole-Group, Small-Group, and Individual Work in Connected Learning Environments

Online instruction is effective and more engaging when there is a variety of activities and experiences for the students (Boettcher, 2011). In a connected learning environment, differentiated instruction is just as critical yet may need to be implemented in different ways. Teachers can:

- Connect in a synchronous videoconference setting with the whole class for new content instruction, book readings, or brief check-ins at set times of the day for general questions.
- Set up short, 20-minute targeted small group times (or 10-minute for individuals) for differentiated instruction to instruct students on key elements needed.
- Assign online individual practice that allows students to master a newly learned concept and spend longer or more flexible periods of time to complete an assignment.
- Post short, tailored, concept-specific instructional videos that can be accompanied by an online activity or printed worksheet and be assigned as needed to groups or individuals.
- Assign interactive practice activities within computer adaptive instructional programs so students' progress can be tracked with built-in assessments. Building in a variety of opportunities for students to work together and individually is recommended to keep the students motivated and engaged in the virtual classroom.

(See "Elements of Connected Learning" for other considerations.)

While assessment and instructional planning to support differentiated instruction require more of teachers when compared to non-differentiated instruction, research shows that the effort is worthwhile. Hattie's (2015) meta-analysis found substantive effects of the components of differentiated instruction, with large effect sizes for educators basing their instruction on students' prior learning, providing formative evaluation, and setting appropriate levels of challenge.

School-based implementation studies have also found positive effects of differentiated reading instruction (Connor et al., 2011) and differentiated math instruction (Connor et al., 2018). Teachers also report that **differentiated instruction leads to greater student motivation and engagement,** more personalized learning, and greater student success (Stetson et al., 2007) with prolonged implementation reducing achievement gaps across several disciplines (Tomlinson et al., 2008).

▶ SCIENCE OF LEARNING STRATEGIES

In order to accelerate and deepen learning, educators will want to focus on the most impactful evidence-based strategies for instruction and practice. Several reviews exist that identify approaches having the largest impact on student achievement (Hattie, 2006; Marzano et al., 2001). Some of these high-quality instructional elements include:

- **Scaffolding:** Scaffolding is a teaching method that enables a student to solve a problem, carry out a task, or achieve a goal through a gradual release of responsibility

from the teacher (Griffiths et al., 2006). Students will need opportunities throughout the school year to work alongside teachers and their peers as they work outside their comfort zone to build autonomy and demonstrate that they are capable of mastering new skills without assistance.

- **Feedback:** Feedback that supports learning flows in many directions, either immediately or after a delay (Agarwal & Bain, 2019). For example, students are informed if they are on the right track and why, while teachers get information about what supports the students need. The impact and timing of feedback depends on the context, but generally, the faster the feedback the better.

- **Retrieval and Spaced Practice:** Distribution of study sessions for different learning tasks occur over an extended period (Cepeda, 2006). Students will need the ability to continually practice various learned skills throughout the school year both in and out of school by utilizing digital learning platforms that incorporate other effective strategies including feedback and scaffolding.

- **Storytelling:** Incorporating the creative arts can effectively meet the needs of the interconnected social, emotional, and academic aspects of learning (Immordino-Yang et al., 2007). Activities such as yoga, dance, visual arts, drama, and music led by educators within or outside the school allow for additional supportive relationships as well as varied opportunities for catharsis (Rhodes & Schechter, 2014).

Whether in person or online, many of these same principles apply. Online learning programs provide students with appropriate scaffolding and feedback but may vary in the level of responsiveness. Some programs have adaptive instruction, which enables additional support or accelerated learning rather than requiring students to follow a rigid path. Open channels of communication between students and teachers in a safe and nurturing environment allow teachers to understand students' current thinking and reasoning, while also providing much need course correction and encouragement that students are capable of success.

Additionally, **prioritizing online learning that incorporates retrieval and spaced practice principles will accelerate students toward mastery**. Students need adequate time on task for reinforcement, time in between the tasks to ensure longer-term memory, and opportunities for assessment. Including rest, exercise, and relaxing or playing with others as suggestions for in-between times will also support social, emotional, and academic learning.

As educators have moved through the Connected Learning Model, they have noticed and empathized to know if and when students are ready for learning, they have identified what students know and what they have yet to learn, and they've organized learning moments so that they will result in deep learning. Now, they need to know what tools/resources/materials they should use to actually teach the content. They need to leverage high-quality curricula.

LEVERAGE HIGH-QUALITY CURRICULA

The moment schools closed, teachers instantly lost access to all of their resources. The bins of manipulatives, the file boxes with lesson plans and worksheet masters, the anchor charts on the wall, and even the most basic tools of blackboard and chalk were gone. The shift being asked of them wasn't to start adding new tech, but it was to pivot from mostly low-tech to all digital-tech. The rug was simply pulled out from under them.

As the structure for learning is transformed, allow high-quality curricula to take some of the load off the teachers. Let the curricula make sure the standards are covered, the differentiation supports are built in, and the design is universally accessible. The curricula's tools provide a cohesive student experience that guides them through the work and a complementary teacher experience that lets teachers know who to celebrate and who needs help. Let the tools do the heavy lifting so teachers can focus on the students' SEL and academic needs.

▶ THE CONNECTED LEARNING SYSTEM

A curricular system that supports the Connected Learning Model leverages effective materials that are research-based, externally reviewed, and have demonstrated efficacy for students across a range of abilities. Schools will need to reassess all teaching tools with the lens of digital capacity for connected teaching.

- The ideal **Core curriculum** includes rigorous standards-aligned content with comprehensive support for students at grade level. All students explore concepts and themes together, and then deliberate practice occurs in small groups or through 1-on-1 support.
- **Supplemental** programs complement the core curriculum by providing strategic additional instruction and practice in areas that need to be strengthened and reinforced to meet the needs of all students. These programs would also support students working above grade level.
- **Intervention** programs are designed to specifically meet the needs of a smaller group of students who are exhibiting skills well below grade level and need explicit instruction and additional targeted practice to accelerate their growth toward grade-level ability.

To maximize personalized direct instruction without overloading teachers' time, adaptive online supplemental and intervention programs can be utilized to effectively place students where they are in the scope and sequence and then scaffold support when they run into skill gaps. Skills reports that teachers receive from daily use of interactive, data-collecting tools allow teachers to create flexible grouping to execute deliberate practice at a granular skill level and accelerate gains (Schechter et al., 2017). As schools transition to a connected learning environment, it will be essential that implementations utilize high-quality curricula.

These curricula will have many of the same attributes as in-person programs, but leaders will need to focus even more on their digital components. They will need to be evaluated to ensure that they meet the principles of Universal Design for Learning (UDL), contain systems for monitoring and engaging students, and enable teachers to be effective facilitators of the online content.

Characteristics of High-Quality Educational Technology Tools

Well-designed educational technology solutions offer many positive benefits for all students. Effective online personalized instruction programs have these characteristics:

- Diverse characters and themes
- Motivational supports including choice, indicators of progress, and celebrations of achievements
- Accessibility features
- Universal Design for Learning approach
- Effective practice that leads to mastery
- Adaptations for students who need support or are ready to move on
- Efficacy research and/or content review by third parties

- Systematic and cumulative scope and sequence
- Explicit instruction, with scripts for teachers or families to read as needed
- Data collection for evaluating growth and providing skill-level diagnostic information about students
- Social and emotional learning skills integrated throughout

These elements help save teachers' time, accelerate students' growth, and incorporate motivational support systems, particularly for those students who are struggling. Strong structures for monitoring and engaging students can prevent disengagement and promote perseverance.

▶ **UNIVERSAL DESIGN FOR LEARNING**

Universal Design for Learning (UDL) is a research-based framework that helps curriculum designers and teachers create learning environments that are inclusive and effective for all learners. UDL is primarily based on three principles:

1. Provide multiple means of representation,
2. Provide multiple means of action and expression, and
3. Provide multiple means of engagement (Center for Applied Special Technology [CAST], 2011).

The principles of UDL help reduce barriers in instruction, provide appropriate accommodations and supports, and maintain high achievement expectations for all students, including students with disabilities and students who have limited English proficiency. Research demonstrates that **UDL yields positive benefits to improve access to and participation in the general education curriculum for all students** (National Joint Committee on Learning Disabilities, 2008).

In a connected learning environment, rich instruction that occupies multiple sensory channels has become an even more crucial yet challenging task. Not only does UDL reach a broader diversity of learners in the general classroom, it also ensures that reach extends to the 15% of public-school students with physical and cognitive disabilities. These very same practices—featuring alternative formats for media (closed captions, transcripts, text descriptions of images) and techniques for increased readability—can also address many of the situational challenges introduced by remote learning. In fact, ensuring that online learning experiences are usable by students and teachers with disabilities, both by design and in compliance with the Web Content Accessibility Guidelines (WCAG) (World Wide Web Consortium, 2018), is a prerequisite to make any online learning a viable option for public schools. UDL and WCAG then work together to make online learning a possibility for a diversity of students, in a diversity of situations, while directly supporting teachers with students who previously required in-person supports.

▶ MONITORING AND ENGAGING LEARNERS IN A VIRTUAL CLASSROOM

In addition to ensuring an inclusive environment for students, a connected learning system relies on a technical infrastructure that facilitates teachers' understanding of student engagement and progress, as well as supports the student's (or family's) ability to navigate the numerous programs they may need to interact with across a day. For those students who are intrinsically motivated to learn, changing the environment from an in-person to a virtual classroom may not significantly change their learning behavior. However, for those students who already struggle with active engagement in the classroom setting, the at-home or virtual classroom may pose an even greater challenge.

Students become disengaged more easily without accountability, encouragement, or extrinsic motivation supplied by the educator or the system itself. Leaders can support consistency for families by providing teachers with guidelines in two areas:
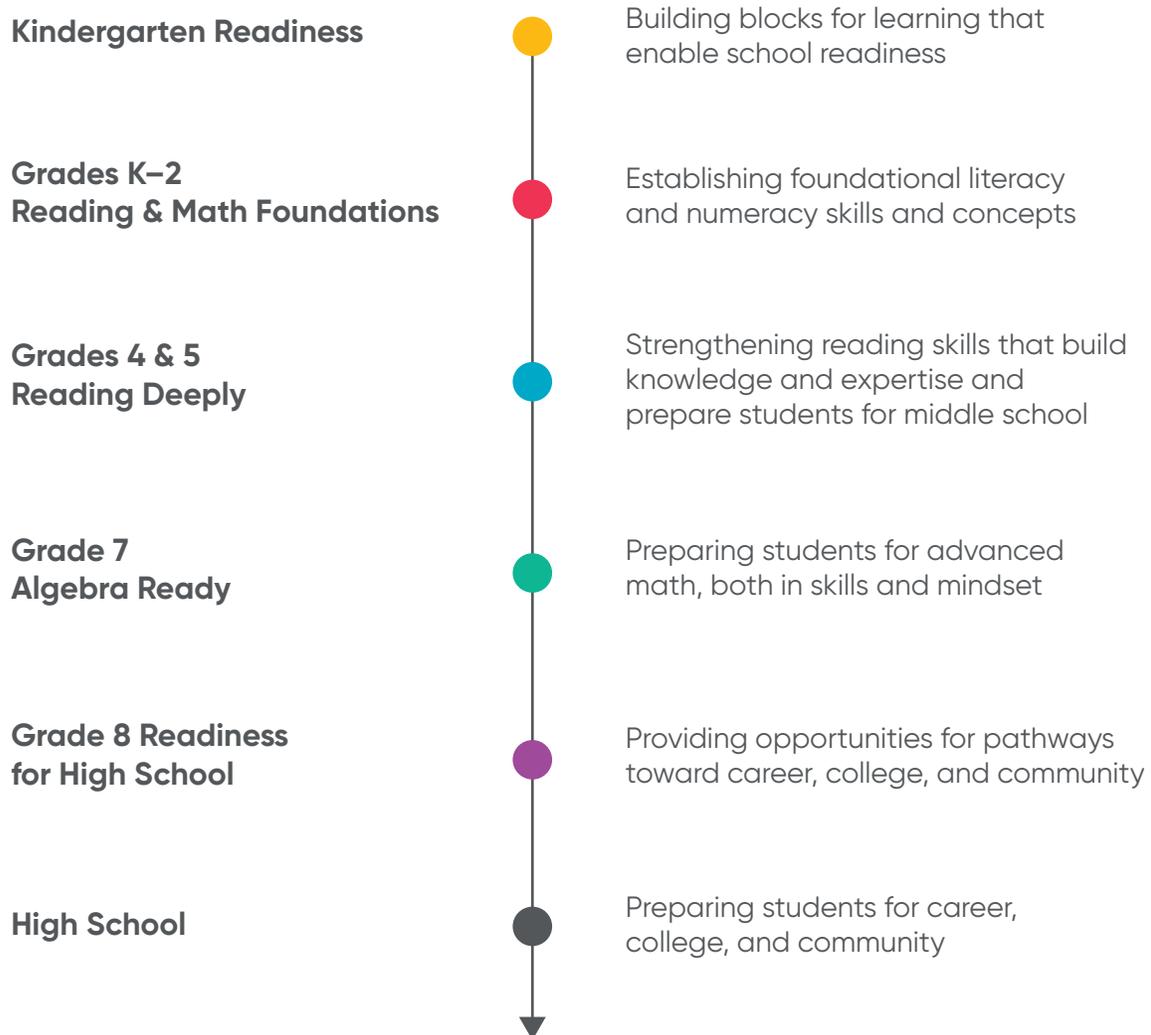
- **Logging in to the course environment regularly**, providing quick replies to student inquiries, and being active in discussion boards are ways of maintaining student engagement, and
- **Providing an incentive system** that is tied directly to the desired behavior (e.g., logging in to a program a certain number of times or completing assignments) may be helpful, particularly if it is matched with short- and long-term goal setting and rituals of group celebrations when goals are met.

Providing online support and immediate feedback with activities and assignments is more challenging when the student is not physically sitting near you. In a classroom setting, students raise their hand, ask the question, it's answered, and they can move on. Teachers can also monitor facial expressions and body language to know if a concept needs repeating or if students are ready to move on. In a virtual classroom, the longer that questions remain unanswered, the more likely students are to just drop off. Providing feedback quickly is appreciated by students, yet receiving delayed feedback is also beneficial for learning and is better than no feedback at all (Metcalfe, et al., 2009).

Ages and Stages for Learning

Ideal research-based core, supplemental, and intervention programs meet the needs of all learners at each stage in the various subject domains. However, it is important to note that each grade level has significant developmental milestones for the learners to achieve (Figure 4), and schools need to consider how to develop and nurture students' skills at key stages to ensure long-term success for each age group. Schools need to provide high-quality curricula, resources, communications, and support to educators, families, and the community to ensure students can meet each developmental milestone so that all learners can be career and college ready.

FIGURE 4. Ages and Stages for Learning: By Grade Level and Focus Area

Grade Level	Focus Area
Kindergarten Readiness	Building blocks for learning that enable school readiness
Grades K–2 Reading & Math Foundations	Establishing foundational literacy and numeracy skills and concepts
Grades 4 & 5 Reading Deeply	Strengthening reading skills that build knowledge and expertise and prepare students for middle school
Grade 7 Algebra Ready	Preparing students for advanced math, both in skills and mindset
Grade 8 Readiness for High School	Providing opportunities for pathways toward career, college, and community
High School	Preparing students for career, college, and community

When the curricula is well-designed, differentiated, motivating, and enables a student-teacher data feedback loop, then teachers will be more effective in accelerating student growth. Once the suite of tools has been chosen, leaders next craft the culture of teachers using these tools—transitioning their role from instructors to facilitators of learning.

▶ TEACHER AS CONNECTED LEARNING BRIDGE AND FACILITATOR

Teachers' roles and responsibilities shift when teaching in a virtual classroom. Research shows that successful educators are flexible with their time and in their use of instructional strategies to manage and accommodate learner progress, emotions, and motivation when online (Black et al., 2009). Teachers can create detailed action plans using reports with summaries of students' online activity, completion of course assignments, students' performance on those tasks, and other software usage data that point out which students need help (Baghdadi, 2011). When performance data on skills is aggregated across programs and assessments, teachers can more easily make data-driven decisions to accelerate learning.

There is a **balance to discover between flexibility and routine** that is unique to each teacher, student, and family unit. Establishing school- or grade-wide guidance on scheduling and the amount of time students are expected to be working at home will aid families in planning and coordinating learning with multiple children. Providing times that teachers are available for immediate questions is important for students, particularly when they are stuck with an assignment at home.

Even more so than during in-person classroom sessions, students have a **limited capacity for intense focus and attention** in virtual classroom sessions (Dixon & Kirmes, 2020). When students are online, aim for shorter, more frequent sessions at 20 minutes or less at a time for Grades K–5. For middle and high school, virtual class sessions could be longer at 30–45 minutes at a time. Space sessions out across the day to give the brain time to process, forget, and then retrieve the content again—this will help students remember the content better.

Classroom management in virtual environments is a key component to quality instruction (DiPietro et al., 2010).
- **Provide structure and a schedule.** "Anytime, anyplace" education imposes challenges on both the student and teacher regarding time management. Assist students in establishing a routine of class activity and communicating that to the learner, who can then develop a plan of study to meet the assigned work's requirements (with the support of the family if needed).
- **Set clear expectations of communication.** Establish norms for how to best contact the teachers, whether by chat, text, email, or phone.
- **Establish rules of conduct.** Review the rules of conduct for online posting of comments; model appropriate tone and emotions in online communication.

Educators set the expectations for classroom management at the building level or at the grade level. They can work together to find the right balance of structure and flexibility to meet the needs of students and families. Teachers are central to building bridges between learning at school and learning at home and serving as facilitators in what's becoming a digital-first environment.

REFLECT AND IMPROVE WITH PROFESSIONAL LEARNING

One of the most impactful ways to support teachers in their reflection on and improvement of their practices is providing them with comprehensive, research-based professional learning. With all the changes that are happening and will happen in schools and communities, it is important to remember that the way teachers learn has not changed. **Effective professional learning is "sustained (not stand-alone, 1-day, or short-term workshops), intensive, collaborative, job-embedded, data-driven, and classroom-focused"** (Every Student Succeeds Act, 2015). Furthermore, it should be focused on content, include active learning, and provide a coherent approach that takes into account district and school goals, teacher knowledge, and student needs (Desimone & Garet, 2015).

The Department of Education has allowed for the use of federal funds for professional learning that does not meet the ESSA definition (U.S. Department of Education, 2020b), such as short-term professional learning events (even emergency workshops), as these one-off events can contribute to comprehensive long-term professional learning to support teachers' overall effectiveness. Connecting workshops to follow-up learning and support among peers and with coaches can help teachers retain new knowledge, practice new skills, and share innovative effective approaches so they can scale. A connection between workshops, coaching, and collaboration is essential for a professional learning program to make a difference in student achievement.

▶ **PERSONALIZED PROFESSIONAL LEARNING: ON-DEMAND, NOT ONE-SIZE-FITS-ALL**

Teacher agency is the capacity of teachers to shape their own professional learning. Leaders can follow seven steps to cultivate engaging and connected professional learning:

1. Consult educators in making decisions,
2. Organize the school day to foster collaboration,
3. Involve and support teachers in analyzing data,
4. Establish learning communities,
5. Allow teachers to choose who they work with and the focus of their learning,
6. Ensure that professional learning is used for growth, not evaluation, and
7. Resist scaling up or mandating a specific form of professional learning (Calvert, 2016).

Long-term connected professional learning includes cohesive features—online coaching, remote peer observations, online collaboration, and facilitated online communities—all with a focus on how to ensure social and emotional well-being and meaningful student learning in digital environments. Schools are working to provide flexible connected learning experiences for students and simultaneously should do the same for teachers. Just as students will return to school with a wide range of at-home experiences and subsequent needs, educators may return to a school environment that is not aligned with their previous skills and training. Differentiated and personalized professional learning will be needed to address those skill and experience gaps to support teachers.

▶ PEDAGOGY FOR CONNECTED LEARNING

In developing a personalized professional learning plan, schools need to consider and prioritize the types of knowledge that are most essential for their teachers. The Technological Pedagogical and Content Knowledge (TPACK) framework for teacher knowledge is an interaction among three bodies of knowledge—technology, pedagogy, and content—needed to successfully integrate technology use into teaching (Koehler et al., 2013). In order to have a successful technology implementation, these three types of knowledge are key, but moving forward **Social and Emotional Knowledge is a critical and integrated component to be considered with TPACK** (TPACK+SEL, Figure 5). As schools embark on connected learning, teachers need support on how to build students' (and their own) skills in self-awareness, self-regulation, social awareness, relationships, and decision-making. Without both teachers and students learning and practicing social and emotional skills, even implementations that have deeply considered technology, content, and pedagogy are unlikely to succeed.

> **Moving forward Social and Emotional Knowledge is a critical and integrated component to be considered with TPACK.**

Teachers with relative strengths in one or more of these areas can use that knowledge to scaffold the acquisition of new knowledge in other areas. For example, an educator with a relatively low knowledge of new technology but rich knowledge of pedagogy, content, and social and emotional learning can use that knowledge base to build an understanding of how technology can be used in the classroom. Many teachers across the country have deep content knowledge but lacked the technological, pedagogical, and social and emotional knowledge needed to suddenly transition to at-home learning in March 2020, causing stress and anxiety in both teachers and students alike.

Emergency workshops and trainings built a temporary bridge that likely focused on technical skills. But to make an intentional transition, educators need comprehensive professional learning programs that connect the technological, pedagogical, and social and emotional knowledge needed for successful implementations of connected learning. Moving forward, schools can continually increase their skillset to deliver instruction more seamlessly between in-person and virtual classrooms, online and pen-and-paper, synchronously (both in person and online) and asynchronously, with whole-group/small-group/individual differentiated instruction for all learners. Transferring these newly learned skills to the classroom will be strengthened by partnerships with experienced and empathetic coaches.

Technological Knowledge

Technological Pedagogical Content Knowledge + Social and Emotional Learning (TPACK + SEL)

Pedagogical Knowledge

Content Knowledge

Social and Emotional Learning Knowledge
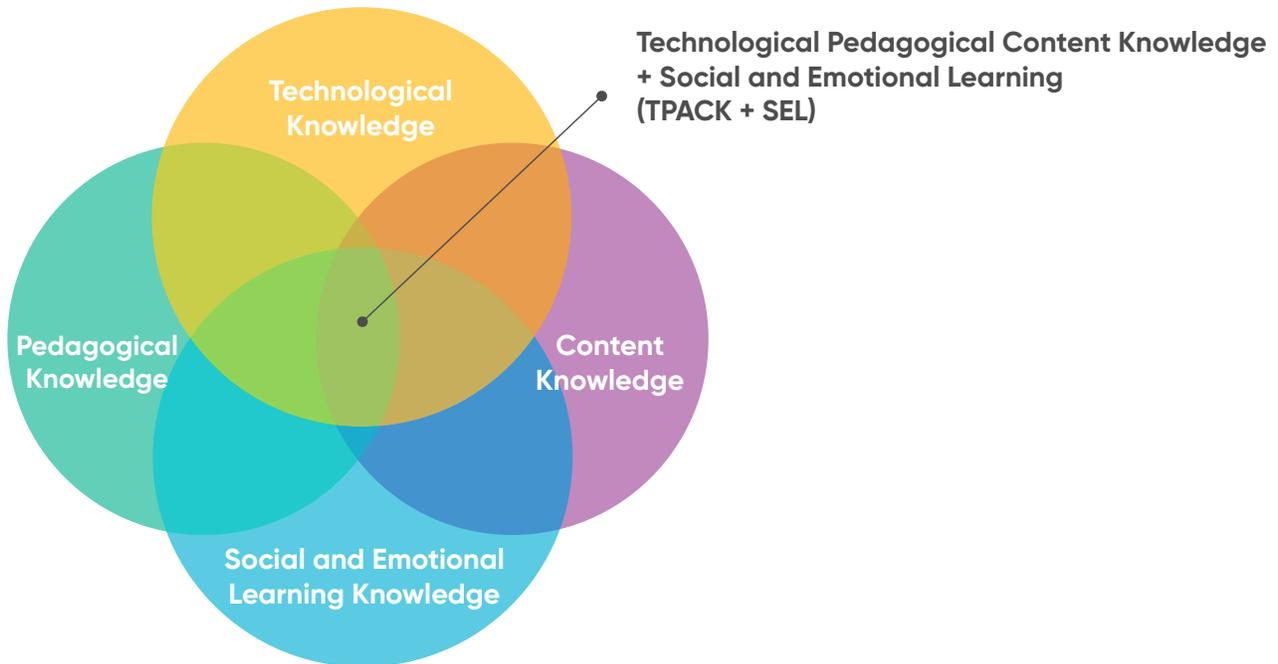
▶ CONNECTED COACHING

Research has demonstrated that sustained, job-embedded coaching is the most effective form of professional learning, whether it is delivered in person or in a virtual setting. By leading with relationships, coaches are in a unique position to support educators in implementing the structure (tools, resources, processes) of a Connected Learning Model and building an SEL-focused culture. A recent meta-analysis of coaching programs found a large effect on instruction and a small to medium effect on student achievement (Kraft et al., 2018). Encouragingly, **teachers who received in-person and virtual coaching performed similarly in terms of instruction and student achievement afterward**. The authors identified several aspects of coaching in a virtual setting as potential strengths: increasing the number of teachers with whom a high-quality coach can work, reducing educators' concern about being evaluated by their coach, and lowering costs while increasing scalability (Kraft et al., 2018).

Research has shown that technology coaches can help educators build skills and improve the impactful use of technology (Bakhshaei et al., 2020). Districts with technology coaches already in place are better positioned to make a transition to connected learning from a TPACK standpoint, but **now coaches will also need to mentor teachers in responding to the social and emotional needs of students**, while also taking care of their own social and emotional needs. Coaches that have relative expertise in technological, pedagogical, content, or social and emotional knowledge might be paired with teachers who have knowledge or experience gaps in those areas. Teachers may also be able to prepare for students' increased social and emotional needs before they return to the classroom through virtual practice environments that simulate the "on the job" environment (Cohen et al, 2020). Even without a virtual practice environment, teachers could role-play potential scenarios with coaches to achieve a similar benefit. Teachers can collaborate with colleagues to discuss scenarios they are likely to face and share ideas for research-based solutions to those problems.

▶ COLLABORATIVE CAPACITY BUILDING

While job-embedded coaching has proven to be the most effective form of professional learning, collaboration among and between teachers and leaders has the most potential to build collective efficacy across schools and districts. By fostering a collaborative culture, school leaders can ensure that educators feel like they belong to the school community and have a voice in establishing that culture. The aforementioned nationwide survey of educators found that "**collaborating with colleagues to develop engaging/effective instruction for students" was the number one area of optimism reported by educators** (Houghton Mifflin Harcourt & YouGov, 2019).

Many districts, schools, and teachers have taken advantage of an unfortunate situation to build collective teacher capacity and efficacy in connected learning. By leaning into existing online Professional Learning Communities, virtual teachers' lounges, and social media to tackle problems, **teachers have formed communities of support**. Teachers with expertise in technology, pedagogy, content, and SEL have helped and will continue to help their colleagues to build their knowledge base and implement impactful practices in each of these areas. As these relationships strengthen, teachers will build collective efficacy and develop a continuous improvement mindset.

LEAD WITH A CONTINUOUS IMPROVEMENT MINDSET

As teachers and leaders implement the Connected Learning Model, they will find that, by continuously reflecting on and improving their practice, they will then be able to notice and empathize with a renewed focus. Following the Connected Learning Model gives all school staff a structure to foster growth within the distinct steps: **Notice and Empathize** with the school community, **Assess and Identify Needs, Use Data to Inform Decision-Making, Leverage High-Quality Curricula, Reflect and Improve, and then begin again**. By working within a collaborative culture, school leaders and teachers can move quickly to understand what they have already done, what is working, and what isn't working. From this reflection, school leaders and teachers can improve academic growth and the well-being of the whole school community.

Choose a Framework for Continuous Improvement

The Connected Learning Model supports skill acceleration for students and teachers, as well as social and emotional support for all. The model is a structure that allows everyone to use the same terminology, know what the goals are, monitor and celebrate progress toward goals, and collect data to help leaders know what is working and what needs attention and support. When everyone knows the milestones, understands the tools and resources, and knows what process to use, then the school has a culture in which all the team members are rowing in the same direction toward the goal. Effective leaders will not only set up this structure and implement each step of the model but also foster a culture of continuous improvement and reflect on how the structure and culture of the school could be improved. They will prioritize where to start, set goals, make a plan, and monitor progress toward those goals. Leaders with this mindset will know that it is not important to get it right the first time but to continuously reflect and improve on the process to enable growth and connect learning for the whole school community.

Examples of Continuous Improvement Frameworks
- Rapid cycle program evaluation (Office of Educational Technology, 2020)
- Social Emotional Learning Focus (such as CASEL; CASEL, 2020)
- Equity-Centered Design Thinking (National Equity Project, 2020)

LEADING INTO
THE CONNECTED LEARNING ERA

This crisis has highlighted the many vital issues facing students across the United States: uneven access to educational technology and the internet, inequities in familial support, homelessness, and inadequate access to food and health care. As Paul Reville wrote on The 74 Million:

> "It's as though a big wave has pulled back the sea revealing the ocean floor and all its disturbing realities that had heretofore been hidden beneath the surface of the water. Before that wave comes crashing back down, concealing reality once again, we should take advantage of the current sense of urgency to do something" (Reville, 2020).

While dramatic change can be inspiring, revamping an entire operation during the crisis may create more uncertainty and stress for everyone. Instead, create a shared vision, set up short-term and long-term goals, and establish a culture of continuous improvement to mitigate the negative impacts of the crisis and support everyone's ever-changing needs.

GET
CONNECTED

Although each school leader faces challenges unique to their community, many communities are facing similar challenges. It is important that school leaders consider both their unique needs and circumstances, as well as communicate with and learn from other leaders that are addressing similar issues.

Start with assessing **basic needs** to get connected (e.g., high-speed internet, sufficient number of suitable devices) and evaluate needs for **housing supports** (e.g., housing, electricity, quiet and ergonomic work space) and **nutritional support** (e.g., sufficient and healthy food, OTC medication, prescriptions, and medical care). Next assess **learning needs,** such as learning supplies for students and teachers (e.g., paper, pens, pencils, printer & toner), **learning supports for students** (e.g., age-appropriate books, reading materials, worksheets or digital tools, and learning activities/games), and **learning supports for teachers** (e.g., print and/or digital version of curriculum guides, immediate professional learning needs). Last, and continually, assess **family learning needs**, such as access to translated materials or translation services, clear and concise guidance on supporting their students' learning, and simple ways they can support learning through everyday activities, such as cooking, cleaning, and outdoor activities.
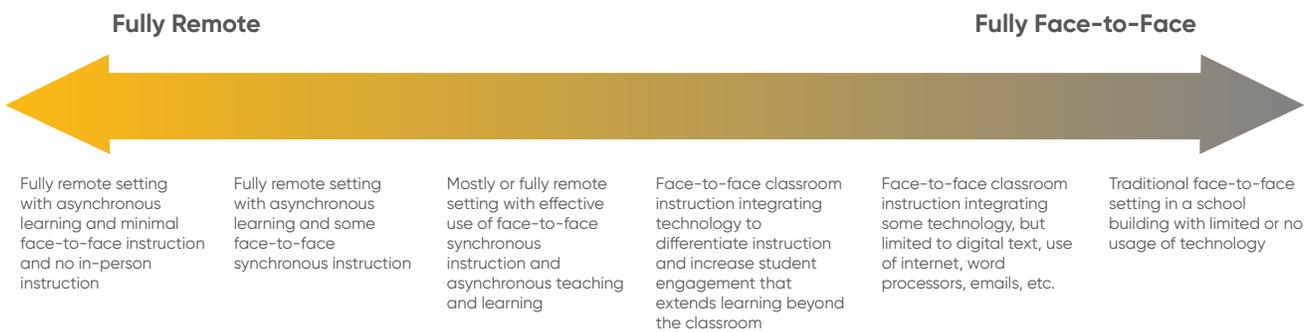
ELEMENTS OF CONNECTED LEARNING

On top of the dire physical, financial, psychological, and health needs that the pandemic has forced all of us to face, for teachers transitioning to a new instructional model overnight posed additional stressors and challenges. What was once a small segment of the education sector (e.g., virtual schools) has now become a nationwide implementation that is similar but different. Consider how leaders will combine elements of in-person and virtual classrooms to collaboratively build and share a vision for a Connected Learning Model.

▶ THE CONNECTED LEARNING CONTINUUM

Connected teaching and learning combines online delivery of high-quality educational content with the best features of in-person classroom interactions to personalize learning, allow thoughtful reflection, and differentiate instruction from student to student across a diverse group of learners. Figure 6 illustrates how connected learning falls on a continuum between fully online and in-person instruction (Watson, 2008); the interwoven use of evidence-based practices from both online and in-person modes of instruction is the connected learning experience.

FIGURE 6. The Connected Learning Continuum

Fully Remote → ← **Fully Face-to-Face**

Fully remote setting with asynchronous learning and minimal face-to-face instruction and no in-person instruction	Fully remote setting with asynchronous learning and some face-to-face synchronous instruction	Mostly or fully remote setting with effective use of face-to-face synchronous instruction and asynchronous teaching and learning	Face-to-face classroom instruction integrating technology to differentiate instruction and increase student engagement that extends learning beyond the classroom	Face-to-face classroom instruction integrating some technology, but limited to digital text, use of internet, word processors, emails, etc.	Traditional face-to-face setting in a school building with limited or no usage of technology

By the back-to-school season of 2020, schools will fall somewhere on this Connected Learning Continuum, and when schools reopen, many families may not feel comfortable having students leave the home. Schools may reopen their doors while incorporating significant portions of the online learning experience, and some may remain closed and continue delivering instruction solely online. Consider that direct adaptation of in-person practices to a virtual setting often neglects the unique skills needed when teaching online-only. Research conducted on virtual schools provides additional insight on implementation practices that apply to the virtual classroom that may help school leaders during this time of educational crisis (Corry et al., 2014).

▶ UNDERSTAND THE BENEFITS AND COSTS OF SYNCHRONOUS AND ASYNCHRONOUS ACTIVITIES

The effective use of both synchronous and asynchronous activities requires alignment with the goal of the learning activity (Boettcher, 2011). **Synchronous learning occurs when students and teachers are participating in a discussion or activity at the same time**, either in person or in a virtual classroom. Synchronous interactions in a virtual classroom are often supported by technology, including the use of internet resources and applications. This includes "face-to-face" instruction in real-time (e.g., Zoom meetings) and online chat sessions.

Asynchronous learning occurs when students work alone, or with the help of a family member, on learning resources curated by a teacher or a program. **Asynchronous learning can happen on the learner's own schedule**. Some but not all asynchronous interactions use technology. Examples include using Computer-Assisted Learning (CAL) programs, posting assignments online, prerecorded instructional videos (e.g., YouTube®), and discussion forums. Curriculum content can also be delivered offline in a virtual classroom (e.g., workbooks, printed handouts, etc.).

Synchronous activities may be used to establish connection and community, deliver new content, brainstorm, share discussions, etc. Asynchronous activities may be better suited for activities that require deep thinking, planning, writing, or additional practice, or when allowing students flexibility over their time.

▶ BANDWIDTH VS. IMMEDIACY

In addition, Stanford (2020) noted two other factors that teachers need to consider when choosing the right technology for instruction: bandwidth and immediacy (Figure 7). Bandwidth describes the maximum data transfer rate of a network or internet connection and can determine whether an individual's network can support the selected technology. The second factor, immediacy, refers to how quickly individuals respond when interacting with each other.

High Bandwidth

| Low Immediacy (Asynchronous) | | High Immediacy (Synchronous) |

PRERECORDED VIDEO — ASYNCHRONOUS DISCUSSION WITH VIDEO — VIDEO CONFERENCES

PRERECORDED AUDIO — ASYNCHRONOUS DISCUSSION WITH AUDIO — COMPUTER-ASSISTED LEARNING PROGRAMS

DISCUSSION BOARDS WITH TEXT/IMAGES — COLLABORATIVE DOCUMENTS — GROUP CHAT AND MESSAGING

READINGS WITH TEXT/IMAGES — EMAIL — AUDIO CONFERENCES (PHONE)
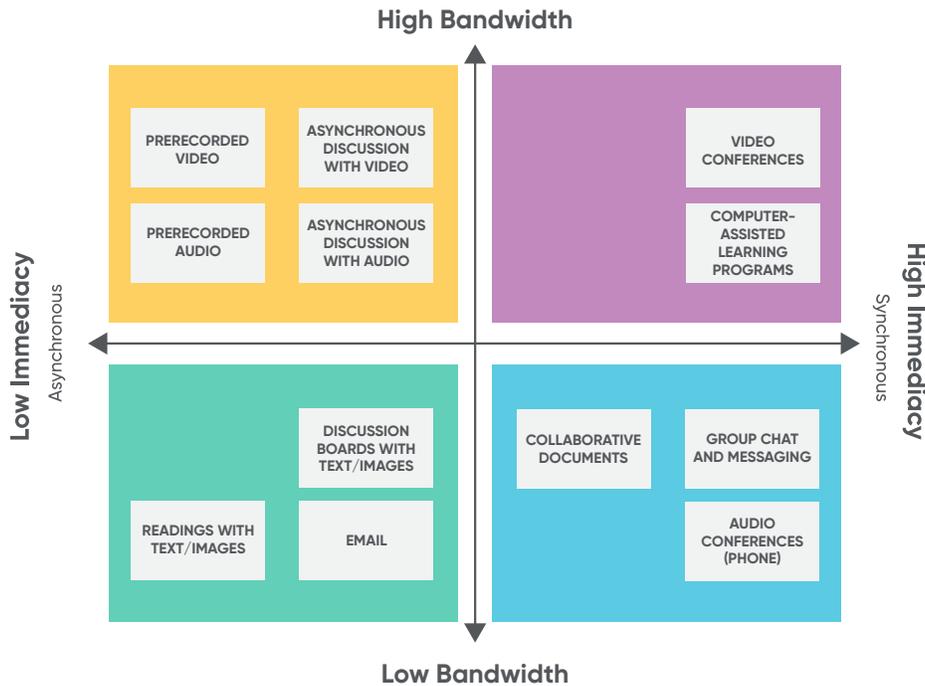
Low Bandwidth

Source: Adapted from Stanford, 2020.

Using low-bandwidth modes of technology can ensure that students access key materials as well as engage in collaborative modes of communication. Low-bandwidth activities with low immediacy allow for students to perform tasks at their own pace and time, while low-bandwidth activities that add high immediacy to student interaction can keep students engaged.

High-bandwidth activities have high engagement and promote student motivation, yet the drawback is they may pose equity issues as some low-SES households may not be able to access or support these technologies. **Teachers can prerecord lessons that have directions for students to interact with materials or pause and reflect**, which students can watch on their own time and avoid high-bandwidth, high-immediacy synchronous videoconferencing. Creativity and innovation will prevail as school leaders and teachers consider how to deliver high-quality instruction while taking into account the technological capacities of the school and the surrounding community.

▶ MAKE STUDENTS' THINKING VISIBLE

Making students' thinking visible requires students to create, talk, write, explain, analyze, judge, report, and inquire about a topic or concept (Boettcher, 2011). These types of activities make it clear to students themselves and to the educator what students know or don't know and what students might be curious about. Additionally, in a virtual classroom, other family members may be present at home assisting students while they are completing their assignments. In some cases, it may not be clear whether a student's submitted work was completed independently or help was received from an adult or sibling. Providing activities and **opportunities that show the student's thinking process** to complete a task allows the student (and teacher) to confirm understanding from concept awareness to concept acquisition.

PLANNING: SHORT TERM, MEDIUM TERM, LONG TERM

Over the past months, school districts across the country have done everything they can to first ensure the health and safety of their students and staff and then continue learning in a virtual and hybrid classroom settings. As leaders, educators, and families have focused on meeting the immediate needs of their students, they have also realized that they need a comprehensive plan to address those needs into the summer, the next school year, and beyond. This requires careful planning and consideration of both the structure and the culture of the school for the short term (spring and summer), medium term (next school year), and long term (post-pandemic).

Developing a comprehensive plan to not only mitigate the adverse effects of COVID-19 but also work toward resolving many of the inequities that the pandemic has revealed will require **deep connections between communities, districts, schools, leaders, teachers, families, and students**. Leading with relationships, education and community leaders will take notice of the needs, take stock of where they are and what they have, establish goals, and formulate plans to meet those goals. The Whole School, Whole Community, Whole Child Model developed by ASCD and the CDC (Hunt, 2015) can serve as a framework for supporting and connecting communities, district and school leaders, teachers, families, and students in the short term, medium term, and long term.

▶ SHORT-TERM PLANNING FOR CONNECTED LEARNING

Structure
Implementing evidence-based practices of instruction along with extending instructional time is critical when accelerating student achievement due to prolonged interrupted schooling.

- **Summer school programs—**Researchers report positive effects on student achievement for mandatory and voluntary summer remediation programs and at-home summer reading programs (McCombs et al., 2011). Researchers recommend that several factors are related to the effectiveness of summer learning programs: regular attendance and participation, high-quality instructional programming aligned to school-year academic content, individualized instruction, communication encouraging family involvement (Kraft & Monti-Nussbaum, 2017), and small class sizes.

- **Extending the school year or day—**Researchers have found evidence of positive relationships between extending the school day and extending the school year and student achievement, with evidence that extending the school year may be particularly beneficial for at-risk youth (Patall et al., 2010).

- **Afterschool Programs**/**Tutoring—**Continuing intensive high-quality instruction beyond the school day is needed to help catch up some students to grade-level content. Heinrich and colleagues (2014) found evidence of a strong relationship between dosage (hours of out-of-school time tutoring) and program effectiveness, with gains in math increasing through 80 hours and gains in reading increasing with up to 60 hours of tutoring.

Culture

Schools are helping to meet the immediate needs of families through organizing meal and device distributions and through consistent communication. **Coordinated, clear, constant, and empathetic communication** through a variety of media between district leaders, school leaders, teachers, families, students, and the community can help reach the goal of making all students and educators feel safe, supported, and connected to their school and their learning. This communication should be easy to read and understand and can take the form of emails, telephone calls, recorded videos, remote meetings, constantly updated websites with links to resources, FAQs, and many others. It is vital that leaders communicate **what is happening right now, what the priorities are, what the goals are, and what tools and resources are available now and are coming soon, as well as highlighting successes or accomplishments** that are helping meet collective goals and reinforce community values.

▶ **MEDIUM-TERM PLANNING FOR CONNECTED LEARNING**

Structure

Leaders will plan for continued periods of interrupted schooling throughout the next school year. These plans can take many forms and will very much depend on the characteristics of each district. Many districts will create plans for interventions like staggered schedules, socially distanced classrooms and events, and continued connected learning. Leaders will **lean on their relationships** with teachers and the community to quickly and carefully **reflect on the lessons learned** in the short term in order to collaboratively construct plans for the medium term. By collaborating with teachers to formulate plans, leaders can help them feel connected to the future of the school and encourage them to return to teaching while at the same time preparing for the fact that, for many reasons, some teachers will not return.

Culture

Leaders can use the connectedness that many families now have to students' learning to build relationships. A collaborative partnership is only as strong and effective as the relationships within that partnership. The basis of effective relationships is trust, which is built through **consistent and predictable actions, modeling of expectations, communication and empathy, and competence with research-based expertise** (Taylor & Chanter, 2016). It will be built by communicating with school leaders, teachers, families, and students to identify problems and potential solutions, inform everyone about the most effective plan, follow through with the plan, and then solicit feedback about how the implementation went and ideas for improving it.

▶ LONG-TERM PLANNING FOR CONNECTED LEARNING

Structure

Schoolwide systems can ensure connectedness through any periods of disruption or interrupted schooling. Iteratively and incrementally, leaders can build a connected structure by identifying learner needs, using data to make informed equity-driven decisions, using differentiated approaches for implementation, and reflecting and refining for continuous improvement. **Maintain communication that centers on community beliefs and core values to help everyone stay grounded and bought into the shared vision.** An essential component to structural improvement, connectedness can be fostered by focusing on goals that impact through a process that is collaborative, efficient, and engaging. Leaders can develop a clarity of strategy that will support change and avoid superficiality and resistance. Effective change leadership provides clarity of purpose, supports disruptive innovators, builds the capacity of others, creates a culture of collaboration, and recognizes success (Fullan & Quinn, 2016).

Culture

Cultivating collaborative cultures and building collective teacher efficacy are essential to improving connectedness across a school district. For change to be long term and meaningful, it must be initiated by the members of the group. Effective teachers are attracted to coherent systems with high social capital and they, in turn, add to the social capital. **Learning leadership builds human, social, and decisional capital amongst its teachers and community partners by modeling learning and shaping culture**. A culture that focuses on collective capacity-building develops a growth mindset, cultivates collaborative student learning, builds teachers' knowledge and skills, engages everyone with clear goals, fosters learning across roles, and follows a cycle of learning, application, reflection, and dialogue. By combining a strong learning design that changes behavior with collaborative work to avoid frustration, surface learning, and (merely) personal growth, leaders can achieve sustained and systematic shifts in culture and learning (Fullan & Quinn, 2016).

CONCLUSION

With every scenario, schooling will inevitably involve maintaining the virtual classroom or remote learning in some capacity, and therefore it is essential to make learning connected for every individual. The Connected Learning Model allows learning to continue under many circumstances and ensures that everyone—students, families, teachers, and leaders—knows the core values and goals of the school and district and knows that they remain the same wherever learning may occur. The path forward will be different for every district, but it is going to require a structure and a culture of connected learning that is influenced by the self, relationships, community values, and global connections.

This is the time to take the lead in not only connecting districts, schools, teachers, students, and families through collaborative connected solutions but also to study and evaluate the implementation and impact of these solutions. Every district, school, teacher, student, and family is unique, and the myriad connections between them only amplify their uniqueness. This requires customized solutions that are implemented with the support of partners that have the capacity and experience to participate in the connected era. It is only through a thorough understanding of the evidence base and efficacy of assessment, instruction, and professional learning that teachers will be able to customize a collaborative approach to connected learning that provides every student with the opportunity to achieve academically and thrive socially.

KEY TAKEAWAYS FOR ENGAGING STUDENTS, EDUCATORS, FAMILIES, AND THE COMMUNITY

Every combination of school structure and community culture is unique. The Connected Learning Model brings together what the research says about what students, families, teachers, and the community might need from leadership to not only mitigate the impact of school closures but also to plan a path for all to thrive.

The Connected Learning Model
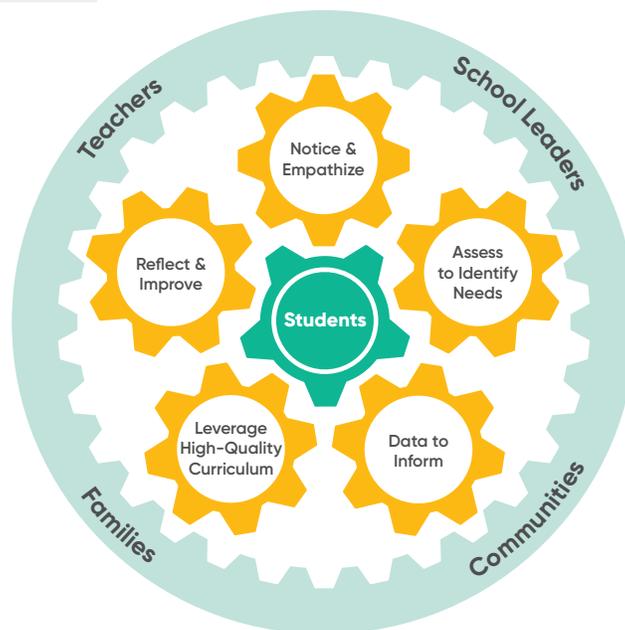
STUDENTS

- **Provide** a safe and open space for student voice by enabling opportunities for respectful sharing of feelings, ideas, and experiences within class routines and integrated in the curriculum through the creative arts.
- **Conduct** an SEL-related needs assessment to understand students' and teachers' social and emotional well-being and target resources to support the challenges of both groups.
- **Use** a variety of assessment methods when using data to identify what learners need, inform differentiated instruction, and improve upon instructional plans for both short-term and long-term goals.
- **Establish** a process (or reinforce a current process) that incrementally and iteratively improves upon itself for delivering support at an intensity that meets the needs of groups and individuals.
- **Focus** on foundational reading skills and procedural math skills that are likely to be impacted by interrupted schooling.
- **Focus** on the work that makes the most impact for long-term success in each age group.
- **Leverage** educational technology tools that give students lots of flexible ways to show what they know and share their work with peers and family.

EDUCATORS
- **Lead** with relationships built on mutual feelings of care, trust, and safety, focusing on establishing connections between teachers, students, and families and ensuring that everyone has the resources and support they need to succeed.
- **Practice** self-care and ask for assistance when needed. This is good for you and serves as a role model for others.
- Continuously **refine and implement** effective online teaching and learning practices consisting of a blend of synchronous and asynchronous delivery of instruction along with the usage of both online learning and offline materials.
- **Participate** in personalized professional development that is sustained, intensive, and collaborative, building toward collective efficacy.
- **Identify** research-based practices for collaboration that are continuous, targeted, classroom-focused, skill-driven, and structured to allow for on-demand and differentiated options.

FAMILIES
- **Acknowledge** that all students and families are experiencing different circumstances and honor that learning at home happens in all sorts of ways.
- **Build** trust and **empathize** with families through consistent and predictable actions, with clear and concise communication.
- **Draw upon** effective learning methods that can be applied in the virtual classroom, even if the delivery mechanisms will have to be adjusted when students are learning at home.
- **Ensure** students, especially younger students, are supported through the new demands of online learning platforms by communicating the expectations and specific instructions via open channels of communication with families.
- **Share** successes about students with families and encourage families to share their success too.

THE COMMUNITY
- **Lead** with an individual's social and emotional health by asking "How are you?" and giving them space to express their feelings, paying special attention to the most vulnerable individuals.
- **Focus** on and **model** positive relationships, self-awareness, self-management, and social awareness.
- **Foster** a mindset and culture of growth that values everyone's contributions and fosters learning, innovation, and action.
- **Influence** the value of what is being taught by addressing the different environments that students learn in.
- **Remember** we're all in this together and better together.
- **Work** with school and business partners to **facilitate** distribution of resources necessary for increased connected learning, such as broadband availability and access to meals, materials, and digital devices.

APPENDIX

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