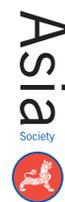


INSTRUCTIONAL PRACTICES FOR DEEPER LEARNING: LESSONS FOR EDUCATORS

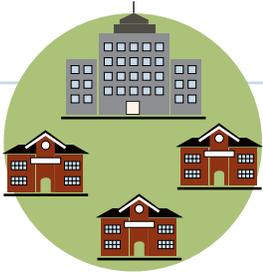
May 2017

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Center
for Global
Education



Instructional Practices for Deeper Learning: Lessons for Educators

In just the past ten years, there has been a remarkable confluence of thinking about instruction and student learning in the United States and internationally. This new consensus emphasizes “mastering rigorous academic content, learning how to think critically and solve problems, working collaboratively, communicating effectively, directing one’s own learning, and developing an academic mindset.”¹ This approach to teaching and learning, commonly referred to as “deeper learning,” has gained traction in recent years as researchers and educators have come to recognize that today’s youth need to develop these competencies to access opportunities in the 21st-century global economy. A National Academies report drew attention to deeper learning, and a follow-up guide for practitioners explored effective teaching approaches for deeper learning in the context of various subjects.^{2,3} Additionally, deeper learning is reflected in rigorous standards such as the Common Core State Standards and the Next Generation Science Standards.

The Program for International Student Assessment (PISA) is an international assessment that measures the reading, math, and science skills of 15-year-old students.⁴ With its first administration in 2000, PISA provided a scientifically reliable and valid measure of deeper learning before the term gained widespread use. Specifically, PISA measures student attainment of critical thinking and problem-solving skills in those three subject areas by the end of compulsory schooling. While PISA is designed to assess national-level outcomes and provide an international benchmark, school districts and schools in certain countries, including the United States, have been given the opportunity in recent years to participate in the PISA-based OECD Test for Schools as a way to obtain school-level results in order to inform school improvement.⁵

America Achieves and the Center for Global Education at Asia Society support school systems in their efforts to improve performance and contracted with Policy Studies Associates (PSA) to examine the instructional practices focusing on deeper learning skills in districts and schools participating in the OECD Test for Schools or PISA. A research team from PSA conducted site visits to high schools in four school districts in the United States and Canada to learn about the instructional practices and strategies taken by educators to promote the deeper learning competencies addressed by the assessments.

This summary brief is intended to provide practitioners with concrete strategies and practices for supporting instructional improvement efforts. It is split into three main sections:

- What can system-level leaders do to promote instruction focused on deeper learning?
- What can school leaders do to support instructional practices?
- What can teachers do to improve instructional practices?

Each section is focused on what educators at each level of an education system can do to improve instructional practices. The goal is for practitioners at the system, school, and classroom level to learn from the experiences of the districts and schools in the study.

¹ http://www.hewlett.org/wp-content/uploads/2016/08/Deeper_Learning_Defined__April_2013.pdf

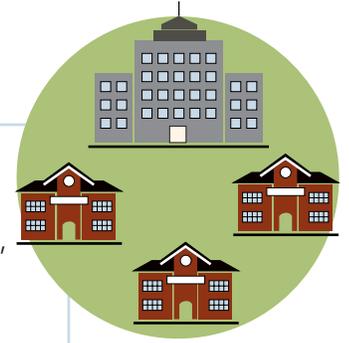
² <https://www.nap.edu/catalog/13398/education-for-life-and-work-developing-transferable-knowledge-and-skills>

³ http://sites.nationalacademies.org/cs/groups/dbassesite/documents/webpage/dbasse_084153.pdf

⁴ <http://www.oecd.org/pisa/aboutpisa/>

⁵ <http://www.oecd.org/pisa/pisa-basedtestforschools/>

What Can System-Level Leaders Do to Promote Instruction Focused on Deeper Learning?



System-level leaders, including chief academic officers, assessment directors, directors of curricula and instruction, and subject-area coordinators within a school district or larger local educational system can strengthen instruction to promote deeper learning competencies through communication, collaboration, and providing support to schools and teachers.

For instance, one school district used data from the OECD Test for Schools as the foundation for conversations and professional development around deeper learning instruction. The district used the results from the assessment as a catalyst to engage high school leaders and provided an online learning module that helped school leadership teams better understand deeper learning competencies and guide discussions in their schools.

In another district, system leaders set policy to support schools in implementing deeper learning. Realizing the need for effective partnerships, the system issued a memorandum that called for educators at all levels to collaborate around a shared understanding and commitment to students. The memorandum encouraged relationship-building among education professionals and emphasized the importance of all educators having a voice, sharing ideas, and communicating in order to achieve a common vision for student success.

The study also saw evidence of systems requiring or strongly encouraging that teachers have time for structured collaboration and planning, so they can share challenges, align courses, develop assessments, receive feedback, and strategize innovative new ways to teach.

System-level leaders can...

Communicate a system-wide vision for instructional improvement by:

- Adopting a common framework or strategy that focuses on deeper learning competencies
- Clearly articulating the vision and plans for implementation of new instructional approaches
- Offering guidance and support to school leaders and teachers to help them understand the framework, competencies, and associated practices
- Using data as the foundation for conversations and professional development around instructional practice and areas for improvement
- Anticipating the time it will take for a system vision to translate to change in teacher practice

Support teacher growth by:

- Ensuring that teachers have structured time to collaborate
- Encouraging various formats of common planning time, including grouping by:
 - Subject and/or grades within a department
 - Cross-grades within a department
 - Grade or cohort
 - Transitional years (i.e., 8th and 9th grade)
- Providing coaches or other district-level support staff to schools
- Determining professional development opportunities based on the needs voiced by teachers and grounded in classroom practice

Strengthen system-level collaboration to support deeper learning by:

- Being cognizant of existing silos within the system
- Prioritizing collaboration and relationship-building between departments and divisions

What Can School Leaders Do to Support Instructional Practices?

School-level leaders, including principals, assistant principals, department heads, and other teacher leaders, can support instructional practices through communication, collaboration, supporting teachers, data use, and technology.

Many school leaders in the study grounded expectations in a common language, understanding, or framework so that all school staff shared a similar mission and approach to instruction. One school established a building-wide emphasis on problem-solving, and school administrators and teachers alike echoed the phrase “purpose plus autonomy equals mastery.” Other schools adopted practices that were embedded into the instructional culture of the school. For example, in one school, every teacher prominently displayed three questions in their classroom so that students had a reference point about the purpose and objectives of each lesson: (1) what am I learning, (2) why am I learning it, and (3) how will I know I learned it? These strategies were simple and memorable so that all educators within the school shared a common understanding of instruction.



School-level leaders can...

Use data to drive instructional improvement by:

- Looking for trends and identifying the most pressing competencies to address
- Using data as leverage to take action
- Using evidence to prioritize instructional strategies for groups of students

Communicate a school-wide vision for instruction by:

- Identifying and articulating consistent expectations for instructional practices or strategies across the school
- Keeping the expectations simple and memorable
- Adopting a vetted framework or strategy for school-wide implementation

Support teacher growth by:

- Encouraging teachers to try new things
- Having teachers provide professional development to their colleagues
- Ensuring there are structures for school leaders to provide direct support to teachers, such as placing assistant principals and deans as instructional leaders
- Providing release time for teachers to co-plan and observe each other's practice

Maximize technology to engage students in learning by:

- Budgeting and investing in technology
- Encouraging teachers to utilize computer-based resources

Collaborate with feeder schools by:

- Establishing a relationship and sharing expectations
- Using data to inform discussions
- Providing transitional year teachers (i.e., 8th and 9th grade teachers) time to collaborate and visit each other's classrooms

What Can Teachers Do to Improve Instructional Practices?

Teachers can strengthen instruction to promote deeper learning competencies through continuously improving their practice, challenging and engaging students in learning, and offering options and flexibility to all learners.

Innovative teachers in the study improved their instructional practices by testing out new ways of teaching. For instance, a high school Spanish teacher piloted a standards-based grading system based on mastery of learning standards. The teacher emphasized the importance of students needing time for mastery and allowing them to retake performance assessments until they mastered concepts adequately.

Many teachers, especially English teachers, implemented thematic units that allowed students to explore a topic through different lenses and modes of learning, forms of expression, and experiences. For instance, one teacher planned an entire school year around the concept of heroism, anchoring each semester in one fictional work supplemented with non-fiction to provide a multitude of perspectives. The teacher also planned a trip to a local museum to further explore the concept of unsung heroes.

Some teachers also offered students options to showcase their learning, acknowledging the importance of student choice. For example, one teacher gave students a comic strip assignment that incorporated key terms and techniques of non-linear plots, including flash-back, flash-forward, foreshadowing, and dreaming. Students could choose to write their own story or retell a story they already knew, as well as which non-linear plot techniques to incorporate into their comic strip. They had the option to design their comic strip on paper or using a computer program.



Teachers can...

Review, revise, and improve their instructional practice by:

- Trying one new practice at a time; not taking on too many changes at once
- Being willing to learn alongside students

Challenge and engage students by:

- Giving students time to think through answers and encouraging multiple responses
- Creating a safe learning space where struggling is encouraged
- Using current events and real-life examples to make learning more relevant by incorporating local and global perspectives into learning
- Providing examples that are relatable to students and offering experiential learning opportunities
- Anchoring learning around themes

Differentiate instruction and offer flexibility for all learners by:

- Identifying barriers that students might encounter
- Approaching concepts through multiple modes of learning, including reading, writing, creating, and interacting
- Encouraging different approaches to problem-solving
- Giving students choices and options to demonstrate their learning

Contents

	Page
Summary Brief.....	i
Introduction.....	1
What Can System-Level Leaders Do to Promote Instruction Focused on Deeper Learning?	3
Communicate a System-Wide Vision for Instructional Improvement.....	3
Support Professional Planning and Growth for Teachers.....	5
Collaborate Across Different Departments and Levels of the System.....	7
What Can School Leaders Do to Support Instructional Practices?	8
Use Data to Drive Instructional Improvement.....	8
Communicate a School-Wide Vision for Instruction.....	9
Support Professional Planning and Growth for Teachers.....	11
Maximize Technology to Engage Students in Learning.....	13
Collaborate with Feeder Schools to Ensure Continuity between School Levels.....	14
What Can Teachers Do to Improve Instructional Practices?	15
Review, Revise, and Improve Instructional Practice.....	15
Challenge and Engage Students.....	16
Differentiate Instruction and Offer Flexibility for All Learners.....	19
Conclusion.....	22
References.....	24
Appendix A-Guiding Questions and Study Methods.....	A-1

Acknowledgements

This report was made possible through the generous support of the Kern Family Foundation and Bill and Melinda Gates Foundation. We would like to thank Elyse Rossi at America Achieves and Heather Singmaster at Asia Society for their continuous guidance and feedback. We would also like to express our sincerest gratitude to the district and school leaders and teachers who opened their buildings and classrooms to the research team and for their willingness to share their practices. Finally, we would like to thank Julie Meredith and Ben Lagueruela at PSA for their work on this report.

Instructional Practices for Deeper Learning: Lessons for Educators

In just the past ten years, there has been a remarkable confluence of thinking about instruction and student learning in the United States and internationally. This new consensus emphasizes “mastering rigorous academic content, learning how to think critically and solve problems, working collaboratively, communicating effectively, directing one’s own learning, and developing an academic mindset” (The William and Flora Hewlett Foundation, 2013). This approach to teaching and learning, commonly referred to as “deeper learning,” has gained traction in recent years as researchers and educators have come to recognize that today’s youth need to develop these competencies to compete in the 21st-century global economy. A National Academies report drew attention to deeper learning, and a follow-up guide for practitioners explored effective teaching approaches for deeper learning in the context of various subjects (Pellegrino & Hilton, 2012; The National Academies, n.d.). Additionally, deeper learning is reflected in rigorous standards such as the Common Core State Standards (National Governors Association, 2010) and the Next Generation Science Standards (NGSS Lead States, 2013).

Overview of the OECD Test for Schools and PISA

The Organization for Economic Cooperation and Development (OECD) coordinates PISA, an international assessment that measures 15-year-old students’ skills in reading, math, and science every three years (OECD, 2017). Specifically, PISA measures student attainment of critical thinking and problem-solving skills in the three subject areas by the end of compulsory schooling. PISA scores provide national results that participating countries use to make international comparisons. Results are given as mean scores and by proficiency levels that categorize performance.

In the United States, individual districts and schools have the option to participate in the PISA-based Test for Schools (known as the OECD Test for Schools), which measures the same competencies as PISA (OECD, 2017). The OECD Test for Schools not only provides schools with national and international benchmarks for comparison, but also a comprehensive report of their school’s data intended to guide school improvement. In contrast, schools participating in PISA both in the United States and internationally are not provided with school-level information.

School performance on the OECD Test for Schools is graphed as a function of socioeconomic background, so schools can see how their performance compares to that of schools with similar socioeconomic backgrounds. In addition to providing subject-specific data, the OECD Test for Schools asks students to complete a questionnaire about their attitudes and perceptions towards school, learning, and relationships with school staff.

The Program for International Student Assessment (PISA) is an international assessment that measures the reading, math, and science skills of 15-year-old students. With its first administration in 2000, PISA provided a scientifically reliable and valid measure of deeper learning before the term gained widespread use. Specifically, PISA measures student attainment of critical thinking and problem-solving skills in those three subject areas by the end of compulsory schooling. While PISA is designed to assess national-level outcomes and provide an international benchmark, school districts and schools in certain countries, including the United States, have been given the opportunity in recent years to participate in the PISA-based OECD Test for Schools as a way to obtain school-level results to inform school improvement (see textbox for more details).

America Achieves and the Center for Global Education at Asia Society both support school systems in their efforts to improve performance by incorporating a global perspective. America Achieves facilitates the Global Learning Network (GLN), a professional learning community for school and district leaders from world-leading schools that are committed to improving education within their own systems and beyond based on shared best practices. Asia Society’s Center for Global Education partners with schools and school systems to promote the incorporation of global

education into policy and practice, including through the Global Cities Education Network (GCEN), which convenes city and education system leaders from the Asia-Pacific region and North America to share promising practices for addressing system-wide challenges in education.

Under contract from America Achieves and Asia Society, researchers from Policy Studies Associates (PSA) examined the instructional practices and school improvement efforts focusing on deeper learning skills in districts and schools that have participated in the OECD Test for Schools or PISA. PSA conducted site visits to four school districts in the United States and Canada that were members of the GLN or GCEN to learn about the instructional practices and strategies taken by educators to promote the deeper learning competencies addressed by the assessments. The schools and systems selected for the study represented a range in performance on PISA or the OECD Test for Schools; however, all were attempting to make improvements, whether they ranked high or low. The research team visited the district office and two high schools in each of these districts; they interviewed educators at every level of the system—within the district, schools, and classrooms, and conducted observations of high school classrooms (see Appendix A for a more detailed methodology). The research team explored the school- and system-level supports provided as well as the associated challenges encountered by educators at every level.

The goal of this report is to provide practitioners with concrete strategies—both big and small—for supporting instructional improvement efforts that target the deeper learning competencies that are at the heart of the OECD Test for Schools and PISA. The report is split into three main sections, focused on what educators at each level of an education system can do to improve instructional practices, to better understand the actions taken across the continuum of an education system. It addresses:

- ***What can system-level leaders do to promote instruction focused on deeper learning?*** This section explores what system-level leaders can do at a high level to support instructional improvement efforts by communicating a system-wide vision, providing time for teacher professional planning and growth, and collaborating across different departments and levels of the system.
- ***What can school leaders do to support instructional practices?*** This section explores what high school leaders can do as the middle-men of instructional improvement efforts between system-level leaders and classroom teachers, including using data to drive instructional improvement, communicating a school-wide vision or strategy, supporting teacher professional planning and growth, maximizing technology, and collaborating with other school leaders.
- ***What can teachers do to improve instructional practices?*** This section explores what teachers on the frontlines can do to improve their instruction, such as continuously improving their practice, challenging and engaging students, and differentiating instruction and offering flexibility to meet the needs of all learners.

This report documents strategies and practices implemented by systems, districts, schools, and classrooms to strengthen instruction and improve student competencies in areas aligned with PISA and the OECD Test for Schools. The study did not assess the impact of these strategies or instructional practices on performance on the assessments. Rather, the goal of the study is for practitioners to learn from the experiences of these districts and schools about how to support innovative instructional strategies and practices that promote deeper learning competencies.

What Can System-Level Leaders Do to Promote Instruction Focused on Deeper Learning?

This section is intended for system-level leaders, including chief academic officers, assessment directors, directors of curricula and instruction, and subject-area coordinators within a school district or larger local educational system. The experiences of the four districts in the study suggest that system-level leaders should consider implementing the following strategies to promote deeper learning within their system:

- Communicating a system-wide vision for instructional improvement that fosters deeper learning by aligning around a system-wide framework or strategy and by getting buy-in from school leaders.
- Providing support for teacher professional planning and learning through the adoption of a system-wide policy that provides teachers with structured time to collaborate, by providing direct support to schools and teachers, and by providing practitioner-focused professional development.
- Collaborating across different departments and levels of the system.

These strategies are intended to be useful in helping system-level leaders assess their current practices and implement new strategies or initiatives across and within schools.

Communicate a System-Wide Vision for Instructional Improvement

School systems in the study varied as to the degree of centralization in their policies and practices. In the United States, policies and instructional approaches are adopted and implemented by the local school district, which may give principals differing levels of decision-making; in Canada, the provincial-level system establishes policy guidance and provides oversight for the district. In any context, it is important that the system leaders develop a vision for instructional practice that is communicated to and shared by educators at all levels of the system. The following section provides examples of high-level leaders communicating a system-wide vision for improvement in instructional practice by aligning around a framework or strategy and getting buy-in from school leaders.

System leaders can communicate a system-wide vision for instructional improvement...

...By aligning around a system-wide framework or strategy. System-level leaders can align their schools around common goals or adopt a system-wide framework that promotes deeper learning. For instance, in the United States one district recently adopted the Understanding by Design framework. This framework is grounded in a three-part, backward approach to planning curriculum, starting with identifying desired results, then determining assessment evidence, and then planning lessons and instruction accordingly (McTighe & Wiggins, 2012). District staff started to use Understanding by Design as a consistent framework for describing instruction across the district, with a focus on application and understanding rather than on content, and required each high school to develop common performance tasks for each discipline. District-level staff also provided principals with monthly professional development. A district coordinator explained the rationale for adopting the strategy:

It's taken the form of really striving for student understanding, as opposed to simply student knowledge or acquisition of knowledge. We have a very concerted effort this year and future years, trying to define what it means to really understand across the board, but also in our specific disciplines. What is the sort of instructional environment that can promote deep understanding? Our test cultures of the past have not really focused [on] understanding. They focused [on]: Do you have the knowledge in your head and can you spit it back out? But we got to get away from that, because that's some shallow learning.

In the Canadian system, the province recently dedicated funding and targeted supports towards a math strategy mandated by the province, but for which districts are responsible for overseeing implementation within local schools. The strategy is designed to improve grade-level compulsory math courses at the high school level and provide professional learning opportunities for school leaders and teachers. It also offers new forms of support to all schools, increased support to some schools, and intensive support to a few schools based on the percentage of students who met the provincial standard in

ninth-grade applied math over the previous five years. The math strategy is rooted in a shared, system-wide vision for education based on goals for achievement, equity, and well-being.

Additionally, in a broader effort to align instructional goals across the entire system, this Canadian district developed facilitation guides and documents that outlined expected practice for every discipline to help coaches and other leaders lead discussions within schools. Aligning efforts and ensuring that system-level messaging is consistent and meaningful for school-level educators is not easy, particularly in large districts. District leaders noted the importance of anticipating this challenge by (1) focusing efforts within the system in targeted ways (such as through the facilitation guides) and (2) recognizing that seeing the system-level vision translated to the classroom level would take time. A provincial leader acknowledged:

We know we are not going to impact change in a year, so this is a three-to-five year strategy. We know when it came to literacy it took us 10 years, but if we go speak to our teachers now, they know very clearly what effective guided reading looks like. We know this is really early on in our journey in mathematics, but this is where we are headed.

...By getting buy-in from school leaders. Some district leaders admitted that “business as usual” was no longer working and that it was their responsibility to communicate the district’s message around instructional improvement. While some teachers naturally have an open mind regarding instruction, some who have been involved in education long enough may have experienced a roller coaster of changes to their practices through the years. Additionally, district leaders in high-performing districts discussed the challenge of getting school leaders and teachers to buy in and understand that instructional changes were necessary and that there were better ways to bring students to deeper levels of understanding. As one district leader said:

I think that’s the hard part, convincing a group of teachers who have done pretty well why there needs to be a shift. Then, the second part to that is convincing a very invested community in education who didn’t learn that way that this is a good way to learn.

Data from assessments, including statewide assessments, the OECD Test for Schools, and PISA, can reveal areas and direction for system-level improvement efforts. District leaders, especially those in historically high-performing districts, acknowledged that buy-in to instructional change was difficult, but credited the use of data to support instructional improvement efforts in helping to engage complacent school leaders. Districts saw the OECD Test for Schools as a catalyst to promote important conversations around instruction with schools. For example, district leaders shared data findings with school leaders and used those findings as an impetus for instructional improvement efforts. One district took a formalized approach by providing an online learning module to help school leadership teams better understand the types of competencies addressed by the assessment, make connections to other assessments, and guide instructional improvement discussions within each school. Another district took a less formal approach and simply had a district leader share assessment data as a means of engaging and encouraging school leaders.

System leaders can communicate a system-wide vision for instructional improvement by:

- Adopting a common framework or strategy that focuses on deeper learning competencies
- Clearly articulating the vision and plans for implementation of new instructional approaches
- Offering guidance and support to school leaders and teachers to help them to understand the framework, competencies, and associated practices
- Using data as the foundation for conversations and professional development around instructional practice and areas for improvement
- Anticipating the time it will take for a system vision to translate to change in teacher practice

Support Professional Planning and Growth for Teachers

While changes to day-to-day instructional practices are ultimately the responsibility of individual teachers, systems can nonetheless play essential roles in providing supports for these changes. The following section provides examples of ways in which system-level leaders can support teacher professional planning and growth by encouraging or requiring collaborative common planning time, providing direct supports to schools and teachers, and providing practitioner-focused professional development.

System leaders can support professional planning and growth for teachers...

...Through the adoption of a district-wide policy that provides teachers with structured time to collaborate. Having set time to work with similar teachers was pivotal to improving the instructional practice of teachers. Without a structured time for formal teacher collaboration, such efforts often get pushed aside or squeezed in intermittently. In two of the four districts included in the study, the school system supported a model in which teachers have common planning time built into the school day. While there were variations in levels of collaboration and innovation amongst teams of teachers, all high school teachers in those districts were encouraged or required by the district to use time for collaborative planning.

The two districts had different approaches in their policies to provide teachers with a structured time to plan and collaborate. In one, the district built into contract hours a 90-minute weekly period for teams of teachers who teach the same or similar courses to collaborate. The second district encouraged a professional learning community model that, while not required, was strongly embraced by many schools, including the two schools in the study that each allotted collaborative planning time for teachers two times each week. In a smaller school serving grades 6-12, one day was dedicated to departmental group planning and vertical alignment across the curriculum, while the other was dedicated to planning with content partners. At the larger high school, one day of planning time was used for content-specific teams of teachers to collaborate and align instruction, and the other was used for cross-departmental teams to come together to discuss cohorts of students and their needs.

In the Canadian district, although teachers did not have a structured time to collaborate built into the school schedule, the adoption of the provincial-wide math strategy had resulted in occasional paid release time for teacher planning related to the strategy. For instance, the province is supporting transitional planning time for eighth- and ninth-grade math teachers. A ninth-grade teacher leader at one school appreciated the system-level support in formalizing and facilitating collaboration with feeder middle schools so that teachers at both grade levels could share expectations and collaborate to make the transition process easier for incoming high school students. Because the math strategy was only in its first year of implementation at the time of the visit, it was unclear how systematic these co-planning opportunities were for eighth- and ninth-grade teachers across the district. Regardless, teachers across all grade levels in the district thought they could benefit from additional dedicated time by planning not only with teachers across school levels but also with teachers within their own departments.

Consistent instructional planning time can provide teachers with the opportunity to collaborate with a like-minded team and to discuss problems of practice, such as how to teach skills and concepts, vertically align across grades and classrooms, develop rubric-based performance assessments, strategize innovative new ways to teach, and test out and receive feedback on instructional ideas.

...By providing direct supports to schools and teachers. In one district, every school is provided a coach, although the intensity of the support is determined by assessment scores. Schools have the flexibility to determine the focus of the work with the district coach as long as it aligns to the district's broader vision for students. In one school, administrators were most interested in better engaging students through inquiry-based approaches. The district-level coach supported the school in incorporating more inquiry-based math by working with ninth-grade math teachers who taught the same tracks in co-planning and delivering lessons.

In addition to coaches, the district was moving towards a model in which there would be centrally assigned principals for clusters of schools. According to a district-level leader, those centrally assigned principals will provide additional support to schools. She said, "They will work and coach and mentor our principals in secondary and elementary schools so that we've created a space...where we are all learning together.... We've moved from having a bunch of people in the middle to really pushing those people into the schools."

...By providing practitioner-focused professional development. One district was accredited to offer continuing education courses for teachers, in which district staff are instructors and the course content is grounded in the context of the district. A district leader described these continuing education courses as an opportunity for teachers to "take theory into action," by directly applying what they have learned into their professional practice. In addition, district leaders described the importance of creating environments for teachers to learn by creating a safe space in which teachers can take risks. The district leader, who is also a course instructor, explained that the purpose of creating such environments is to mimic the environments that teachers create for their students. She said:

It's creating the environment, it's risk-taking, it's safe.... I start with the kind of question that everyone goes 'ugh' [calculus].... The only reason is so that we can have a discussion, what does it feel like to be the learner.... I basically just tell them we are going to teach it like you are my students and I'm your teacher, and we are going to live and model exactly the way you teach.

System leaders can support teacher growth by:

- Ensuring that teachers have structured time to collaborate
- Encouraging various formats of common planning time, including grouping by:
 - Subject and/or grades within a department
 - Cross-grades within a department
 - Grade or cohort
 - Transitional years (i.e., 8th and 9th grade)
- Providing coaches or other district-level support staff to schools
- Determining professional development opportunities based on the needs voiced by teachers and grounded in classroom practice

Collaborate Across Different Departments and Levels of the System

The benefit of collaboration across levels of the education system was especially evident in the Canadian system included in the study. In Canada, the province and the local school district work hand-in-hand to set policy, implement strategies, and support schools. Provincial-level and district-level leaders were enthusiastic about the recent steps taken to create greater alignment between the two systems. The province issued a memorandum that called for educators at all levels of the education system (at the provincial-level, district-level, school-level) to collaborate around a shared understanding and commitment to students. The memorandum encouraged relationship-building among education professionals and emphasized the importance of all educators having a voice, sharing ideas, and communicating in order to achieve a common vision for student success. Provincial leaders and district leaders now attend meetings together; they expressed enthusiasm that more intentional collaboration has led to greater alignment across systems and is moving towards greater coherence. One provincial leader said, “We are working on coherence right now... the alignment is there.... For us it is about the variability in implementation between classrooms, that’s our biggest challenge.”

These system leaders were also intentional about breaking down silos within their respective systems and in collaborating across different departments within the district or province. A district leader commented that although departments within the district have historically worked in silos, senior staff from various offices have started to collaborate more deeply on problems of practice, such as how equity influences school effectiveness. For example, district leaders from the professional learning, equity, school effectiveness, and research offices have come together around equity in recognition that their work is interconnected and that “the student is in the center.” A provincial-level leader also explained the recent shift in having every division at the table during the design and development of the provincial math strategy. She said, “That’s a first for us, but we’ve been grappling with that over the last couple of years, so this is really our first implementation where it is totally integrated, so anything that is designed at this point in time... every division is at the table.”

System leaders can strengthen system-level collaboration to support deeper learning by:

- Being cognizant of existing silos within the system
- Prioritizing collaboration and relationship-building between departments and divisions

What Can School Leaders Do to Support Instructional Practices?

This section is intended for school-level leaders, including principals, assistant principals, department heads, and other teacher leaders. Lessons from the global systems in the study suggest that school leaders should consider the following strategies to help improve instructional practices supporting deeper learning competencies within their school:

- Using data to drive instructional improvement by using multiple data sources to inform a school-wide strategy and by identifying a group or groups of students needing targeted instructional interventions.
- Communicating a school-wide vision for instruction by having a shared language and set of expectations around instruction and adopting a school-wide strategy.
- Supporting planning and professional growth by encouraging teacher-led change and providing ongoing feedback.
- Maximizing technology to engage students in learning.
- Collaborating with feeder schools to ensure continuity between school levels by having conversations to ensure vertical articulation of the curriculum and accuracy of student placement decisions and by providing opportunities for middle school teams to visit the high school.

These strategies are intended to be useful to school-level leaders, particularly at the high school level, in planning for and implementing new strategies or initiatives to improve instructional practices within their schools.

Use Data to Drive Instructional Improvement

Schools in the study used data to identify areas for improvement, both instructionally and culturally, and to target supports towards particular content areas or groups of students. This section provides examples of ways in which school leaders used data to inform the adoption of strategies to help focus instructional improvement efforts.

School leaders can use data to drive instructional improvement...

...By using multiple data sources to inform a school-wide strategy. School leaders found data useful for identifying areas for improvement and valued using multiple data sources to confirm trends in data rather than relying on one source.

For example, one school had a history of deficits in reading comprehension on a variety of assessments, including on state standardized assessments and the OECD Test for Schools. Reading scores on the OECD Test for Schools were lower than what the school could expect after accounting for the school's high poverty (over three-quarters of students at the school receive free or reduced-price lunch). In addition, poor Lexile scores on the Scholastic Reading Inventory prompted the school to have a school-wide focus on literacy; those data showed that over half of the school's ninth-graders and a quarter of graduating seniors were reading at an elementary school

School-wide Reading Initiative

In response to poor reading scores on a variety of assessments, one school began a literacy initiative to promote literacy across the curriculum. There was a school-wide push for teachers in all subjects to incorporate more literacy, especially reading comprehension, into their lessons. An assistant principal formed a literacy committee composed of teachers from every subject area. The committee selected several reading strategies for teachers to begin implementing in their classrooms in winter 2017: scanning text, observing text structure, understanding how pictures relate to text, making margin notes, think-pair-share, and reading aloud. The intention was that those teachers serving on the committee would teach other teachers in their respective subject areas how to implement these strategies during a professional development day or within their professional learning communities. The assistant principal saw the committee's work of spreading the strategies as essential to school-wide implementation. He said, "They're in the classrooms in each of those subject areas... They're going to be the ambassadors, not the administration." The assistant principal credited the national convening hosted by America Achieves as the impetus for starting the committee and selecting suitable strategies.

level. As a result, the school launched a school-wide push for teachers in all subjects to incorporate more literacy into their instruction (see textbox on previous page for more details).

In another school, student reports on the OECD Test for Schools and on the Gallup Student Poll pointed to the need to improve student and staff relationships. To address this concern, the school created a student ambassador program whose mission was to foster student and staff relationships and build an overall better school climate. Student ambassadors, nominated by teachers, formed a panel to discuss why students did not feel supported by staff and to find ways to improve on those relationships.

...By identifying a group or groups of students needing targeted instructional interventions. In a typically high-performing school, the principal noticed that many students were not scoring in the top two proficiency levels on the OECD Test for Schools. The principal wanted ultimately for average students to move up one proficiency level (i.e., from 3 to 4, 4 to 5). As such, during the 2015-16 school year, the principal monitored and imposed some targeted interventions for average ninth-grade students. During the 2016-17 school year, the principal continued to monitor those students as tenth-graders and started to monitor a new group of average ninth-grade students.

The targeted interventions included the formation of two ninth-grade instructional teams that met biweekly: one meeting was to discuss instructional practices and planning, and the other was to discuss student progress and supports, such as extra time for help during the school day and tutoring provided by national honor societies. A major focus of the ninth-grade instructional planning meeting was to discuss data and coordinate instruction between the feeder middle schools and ninth-grade teachers. The ninth-grade student support team included teachers, counselors, administrators, and other support staff who discussed concerns about specific students.

Another principal used low scores on accountability assessments as justification to strategically place his strongest teachers in ninth-grade math classrooms for a minimum of three years. With some stability in these classrooms, he hoped that teachers would be able to predict over time where students would struggle. This strategic placement of teachers worked. The principal said, "Results went up by just having two strong teachers."

School leaders can use data to drive instructional improvement by:

- Looking for trends and identifying the most pressing competencies to address
- Using data as leverage to take action
- Using evidence to prioritize instructional strategies for groups of students

Communicate a School-Wide Vision for Instruction

Communicating a school-wide vision for improvement was a key task for school principals who wanted to set the tone for instructional improvement efforts. This section provides examples of ways in which school leaders can communicate a school-wide vision by sharing a common language and set of expectations or by adopting a school-wide strategy to provide instructional coherence within school buildings.

School leaders can communicate a school-wide vision...

...By having shared expectations and practices. School leaders can ground expectations in a common language, understanding, or framework so that all school staff share a similar mission around education in their building. For example, one school established a school-wide emphasis on problem-solving to capitalize on what, according to the principal, was the "natural curiosity" of all students. A teacher said that expectations for instruction at the school shifted away from a "giant list of things to teach" to a focus that is based much more on "problem-based learning or big concepts and phenomena." Administrators and teachers alike echoed the phrase, "purpose plus autonomy equals mastery." The

principal said, "Our expectations [...] for every teacher is that students have a clear purpose, at some point in their lesson they're given some opportunity for autonomy. Through that, then they'll get some mastery."

This shared language and set of expectations was evident in classrooms at the school. In an example discussed in greater detail later, students created "body biographies," or visual depictions that half-embodied a character from *The Great Gatsby* and half-embodied a modern-day figure with commonalities to the fictional character from the novel. The teacher said:

We wanted to give them a problem to solve. The problem that we came up with as a team was the idea of creating a split depiction of the character that the students had researched, using lines and colors and symbols to portray how the character reflects the American dream of the 1920s. Then extending that to who would that character be in 2016 America? In our current American dream? How would those lines and colors and symbols look different?

Given a problem to solve, the students were urged to think critically about characters from the novel and their modern-day counterparts, and they were also given autonomy to choose not only characters and modern day figures, but also how they wanted to depict them visually. At the end of the project, students presented their body biography and were expected to articulate "a claim of their own" to demonstrate mastery.

In several schools, classrooms adopted common practices that were embedded in the instructional culture of the school. For example, in one school, every teacher had three questions displayed on the board: (1) what am I learning, (2) why am I learning it, and (3) how will I know I learned it? In every classroom, these questions were prominently displayed so that students always had a reference point about the purpose and objectives of the lesson. Similarly, in another school, every math problem was accompanied by a learning goal and success criteria. A teacher noted that once students started to learn a concept, she would ask them to create their own success criteria in order to think through what they should do next in order to accomplish the learning goal.

Universal Design for Learning (UDL) Framework

Several years ago, a school received a grant in conjunction with their regional education center to implement an educational framework called the Universal Design for Learning (UDL). The UDL model is based on a set of three principles that target the unique needs of learners through multiple means of representation, action and expression, and engagement (CAST, 2017). These principles address the what, how, and why of learning. The grant has allowed for collaboration with the regional education center as well as access to consultants who have worked with school leadership and teachers to grow the framework at the school. It took about a year for school leadership and teachers to gain their footing and recognize the value of the framework. As a school with a high concentration of poverty, the school had often served as a testing ground for various initiatives with competing values and different areas of focus. However, school leadership saw UDL as an opportunity to energize school staff around a cohesive school improvement model.

The school initially saw the UDL model as a way to support full inclusion for special education students, but quickly realized that it served as a great teaching model to use with all students, from inclusion to AP classrooms. As such, in the first year of UDL implementation, teachers who taught inclusion classes comprised the UDL cohort. But in the second year, the initiative gained traction. Applications to become part of the cohort were made available to the entire staff. Teachers and administrators visited other UDL schools across the country, and consultants attended teacher and administrator professional learning community meetings. At the time of the visit, the school was on its third year of implementing UDL. The cohort has grown steadily and the whole staff participates in UDL training during the summer. Prior to starting at the school, new teachers receive a two-day training on UDL provided by the regional education center. All school administrators participate in a monthly book study and discussion so that they understand the framework from a teacher's perspective.

Members of the school leadership team noted that they see UDL as more than a framework, as a mindset or a "recipe for good teaching." When planning lessons, teachers think about the UDL framework in providing opportunities for expression and choice.

...By adopting a school-wide strategy. School leaders were also exploring more cohesive, school-wide strategies to promote smart, high-quality instruction that would allow for all students within the school to learn and thrive. For example, a large, urban, high-poverty school received a grant in conjunction with their regional education center to adopt and implement the Universal Design for Learning (UDL) educational framework (see textbox on previous page for details). The school principal quickly saw it as an opportunity for a cohesive school improvement model for all students. After several years, the framework has been embedded into all the work the school does; the framework grounds all initiatives in the school and focuses teacher planning efforts. The principal explained, “We came up with the idea that Universal Design for Learning has to account for all of these things that are coming to us from the school district or the state or whatever the case may be.” An assistant principal at the school described using the UDL model to help focus teachers. She said, “We basically sat in a room with half of our administrative staff and put UDL on the circle, and we fit other components that come in and out of school [...] around it.”

School leaders can communicate a school-wide vision for instruction by:

- Identifying and articulating consistent expectations for instructional practices or strategies across the school
- Keeping the expectations simple and memorable
- Adopting a vetted framework or strategy for school-wide implementation

Support Professional Planning and Growth for Teachers

All educators acknowledged that imbedding “deeper learning” practices such as critical thinking, problem-solving, and application into instruction was slow and difficult work. While there are certainly ways in which system-level leaders can support professional planning and growth for teachers in bringing about changes to their instructional practices, providing most of the direct support to teachers falls to school leaders. School leaders can leverage their leadership to encourage and support teachers to improve their instructional practices and incorporate deeper learning, as they are responsible for providing the frontline support. School leaders can support professional planning and growth by encouraging teacher-led change, by providing ongoing feedback, and by providing opportunities for teachers to co-plan and observe each other.

School leaders can support professional planning and growth for teachers...

...By encouraging teacher-led change. School leaders emphasized the importance of teachers owning, embracing, and leading instructional change for it to impact instruction and persist over time. Across schools, teachers had flexibility in designing and delivering lessons as long as those lessons were aligned to the content standards, scope, and sequence. One principal even encouraged her teachers to “go rogue” and try something different from what other teachers who teach the same or similar subject do. Innovative teachers appreciated the autonomy and support they received to try new instructional strategies. One teacher said:

I also think it's so nice that we have this administration that's extremely supportive of everything we do. They encourage us to try new things, even though it's not always going to work out perfectly.... I really feel encouraged to try new things, as long as I'm trying to push the kids to problem-solve....

While school leaders encouraged teacher autonomy, the extent to which teachers were capitalizing on their ability to try out new instructional strategies varied from classroom to classroom. School leaders believed that the best way to bring about changes to classroom instruction was through teacher-led change; they believed messaging around school improvement should come for teacher leaders, because teachers would be more receptive to instructional change if they heard about it first-hand from their colleagues. School leaders wanted teachers to be the change agents for instructional improvement at the school.

A high school principal was a firm believer in “planting a seed” and supporting a few innovative teachers or teams of teachers in trying out new instructional practices. She noted:

What I've learned in this building is [that] ideas work much better if I can plant a seed in one or two teachers and have it come ground up than for me to stand at a faculty meeting and say, "Okay, now we're going to do problem-based learning and here's how you're going to do it." ... I know where to go and to push and to plant a seed, to give a teacher an idea, and where it will grow and then where I need to come around and maybe push from a different direction to help that process go.

In another school, teachers were essential in spreading school-wide implementation of the strategies established as part of the school vision. According to a school leader:

We provide professional development, where teachers, our own teachers, are the ones providing that development. It isn't just the administrator saying, "You've got to do this and, look, it works." It's the teacher saying, "Hey, I've done this in my classroom, it works." I think that's what has the biggest weight, when we have our teachers actually present that PD and model to them what they've done with their kids and how it's worked.

However, educators also admitted that sometimes teachers felt hindered by needing to adhere to mandated curricula. One district administrator described the challenge of having a traditional curriculum mandated by the state that was centered on knowledge acquisition and persuading teachers that students could still learn the content of the curriculum through more inquiry-based activities. As a result of conflicting priorities across districts and schools, teachers tapping into their autonomy and introducing innovative practices into their teaching practice was still an exception rather than the norm.

...By providing ongoing feedback. Assistant principals, deans of instructions, departmental chairs, and teacher leaders all served in a support role to teachers in the schools and districts in the study. School leaders, whose job was to provide instructional support, completed walkthroughs to informally observe and provide feedback to teachers in a non-evaluative way. While some instructional leaders followed a protocol or provided written feedback to teachers, walkthroughs were meant to provide more frequent interaction as a means of delivering continuous support to teachers.

Instructional school leaders also participated in collaborative planning sessions. In one school, while school leaders provided input and suggestions, the collaborative planning time was mostly teacher-led. In another, collaborative planning time was led by a school administrator. The research team observed a collaborative planning period for math teachers in which a school leader asked pairs of teachers to consider their current teaching practices with regards to critical thinking in their classrooms. The school leader, who was motivated by the results from the OECD Test for Schools, was working with math teachers at the school to embed more critical thinking practices into their classrooms and envisioned that the math team would spend about a month on planning before implementing strategies in their classrooms.

...By providing opportunities for teachers to co-plan and observe each other. In traditional school structures, teachers often operate in silos with little or no time to observe each other's practice. While certainly not the norm, one school used a collaborative teaching inquiry model in which three teachers were provided release time to co-plan and observe each other. Over the course of three months, the three teachers were given one day a month to co-plan a lesson together in the morning, and then one teacher would deliver the lesson in the afternoon. Throughout this three-part cycle, the teacher who delivered the co-planned lesson kept rotating so that each had the opportunity to teach once and observe twice. After each lesson, the three teachers would debrief about what worked well in the lesson and discuss any challenges together. The principal explained, “They all take ownership of the lesson and if it didn't go well, then they all share in that.”

School leaders can support teacher growth by:

- Encouraging teachers to try new things
- Having teachers provide professional development to their colleagues
- Ensuring there are structures for school leaders to provide direct support to teachers, such as placing assistant principals and deans as instructional leaders
- Providing release time for teachers to co-plan and observe each other's practice

Maximize Technology to Engage Students in Learning

While districts could set system-wide policies regarding technology use in schools, principals often had autonomy over their budget and the ability to leverage resources for technology use. Principals maximized technology use to engage students in learning in various ways, including piloting new technology positions within their school and encouraging the incorporation of new technology and resources into instruction.

For example, one high school hired a technology integration specialist to help improve teachers' use of technology in their classrooms. One teacher said, "Just that role of another supportive staff person in the building that encourages you to, you know, not just substitute technology, but really use it for the good of the students." The technology integration specialist introduced an array of Google Suite tools into classrooms.

At another school, the head of the math and physics department convinced his school to invest in several 3D printers, enabling him to incorporate 3D design into lessons. At the time of the visit, physics students were designing 3D sailboats and airplanes. While the teacher acknowledged that the 3D printers were a large financial investment, he believed that it was worth the investment as long as there were plans for continued usage. He saw the 3D printers as a means to engage students by providing them with a hands-on learning experience while also enabling them to acquire marketable engineering skills.

While some schools maximized technology in instruction through large-scale personnel and equipment investments, other schools encouraged the use of smaller-scale resources through software and Internet-based tools. Regardless of whether students were given their own computers, used classroom computers, or used their own devices, school leaders encouraged teachers to incorporate computer-based resources into their lessons. A few examples of resources used in classrooms included *Storyboard That* (comic strip software); *Kahoot*, *Kahn Academy*, and *Quizlet* (online learning interactive learning tools); *vocabulary.com* (a vocabulary website); and *Kurzweil* (computer software that reads text aloud). The research team also observed a Spanish teacher who had students pull up a Google Form on their cellphones and respond to questions about a short video they had seen.

School leaders can maximize technology to engage students in learning by:

- Budgeting and investing in technology
- Encouraging teachers to utilize computer-based resources

Collaborate with Feeder Schools to Ensure Continuity between School Levels

High school leaders considered ways to better establish continuity of education between middle and high school with feeder schools. One principal noted that academic planning should start well ahead of high school so that the transition to high school academics is smoother for students. Conversations that high school leaders had with feeder schools (mostly middle schools) were mostly about vertical articulation of curriculum and student placement, although one school described providing opportunities for school visits.

School leaders can collaborate with feeder schools to ensure continuity between school levels...

...By having conversations to ensure vertical articulation of the curriculum and accuracy of student placement decisions. One district in particular had placed an emphasis on coordination and collaboration between middle and high schools. The research team observed a ninth-grade planning meeting in which teachers and school leaders were looking at current ninth-grade students' Lexile scores on the MAP assessment as eighth-graders to determine if their placement decisions made sense or if there needed to be realignment with the middle school. One teacher leader explained that the school holds cluster meetings with the middle school to "openly communicate in a non-defensive matter" about expectations and student exposure to certain skills prior to entering high school. Another teacher leader who led the ninth-grade collaborative team orchestrated the streamlining of middle school interventions into ninth-grade instruction in order to make the transition to high school easier for students.

The same district focused on using data to inform student placement decisions. The chief academic officer said:

High schools are looking at their data and being able to have conversations with middle schools about student placement...so that the connection is getting better. It has to do with the data that high schools can see. Then, the middle schools benefit by having those conversations with the high schools, knowing that the kids weren't appropriately placed, or they could've been challenged more, or why were they given accommodations?

In addition, in both schools in the district, high school leadership had begun to share first-quarter grades with their feeder middle schools in order to inform conversations around correct placement. One principal said that this practice was affirming because more often than not middle school recommendations were accurate.

...Through providing opportunities for middle school teams to visit the high school. In another district, a high school leadership team brought together school leadership teams from feeder elementary and middle schools not only to coordinate and collaborate, but also to observe each other's classrooms. An assistant principal saw this as a chance for elementary and middle school teachers to learn and become familiar with the instructional strategies and culture of the high school. He said:

It would be great to have their [elementary and middle feeder schools'] input and let them know, 'Hey, these are the strategies that we're focusing on here in high school. Could you start doing that, please, at the elementary and middle schools so that they're familiar with them by the time they get here?'

In the Canadian district, high schools were working to improve coordination with feeder middle schools as part of their efforts to align around the provincial-wide math strategy and streamline academics from middle to high school.

School leaders can collaborate with feeder schools by:

- Establishing a relationship and sharing expectations
- Using data to inform discussions
- Providing transitional year teachers (i.e., 8th and 9th grade teachers) time to collaborate and visit each other's classrooms

What Can Teachers Do to Improve Instructional Practices?

This section is intended to provide suggestions for teachers in planning for and implementing new strategies or initiatives within their classrooms. The strategies highlighted in this section are well-aligned to the key practices that the National Academies' Guide for Practitioners (n.d.) highlighted around teaching to support deeper learning, including using multiple and varied representations, deeper questioning, challenging and engaging students, and making learning relevant. As such, teachers may want to consider the following strategies to help improve their instructional practices and incorporate deeper learning strategies in their classrooms:

- Reviewing, revising, and improving their instructional practice by trying one new thing at a time and being willing to learn alongside students.
- Challenging and engaging students by encouraging a productive struggle, by drawing connections to real-life and current events, and by exploring a topic from different lenses.
- Differentiating instruction and offering flexibility for all learners by tailoring instruction, encouraging multiple ways to solve problems, and by giving student choices and options.

Review, Revise, and Improve Instructional Practice

The OECD Test for Schools provides school leaders and teachers with direction for improvement around deeper learning, but teachers need to be willing to take on the challenge of making difficult changes to their instructional practice. While teachers were generally receptive to the idea that business as usual was no longer working, changes to instructional practice requires difficult work. Educators acknowledged that change can be jarring and that restructuring instruction around deeper learning strategies like critical thinking and application was much more challenging than traditional lecture. This section explores ways in which teachers can review, revise, and improve their skills and instruction by trying one new thing at a time and by being willing to learn alongside students.

Teachers can review, revise, and improve skills and instruction...

...By trying one new thing at a time.

Teachers acknowledged the challenge of incorporating new or innovative instructional practices, citing that it is a slow and difficult process. Compounding that, teachers are pressed for time and have competing priorities and expectations. As such, it might be more manageable for teachers to try one new thing at a time, rather than trying to change their entire practice all at once. For example, a high school Spanish teacher was given the opportunity to pilot a standards-based grading system in which grading was based on student mastery of learning standards on performance assessments (see textbox for more details). The teacher advised others who wanted to make changes to their instructional practices to take on one new idea per semester or year. She explained:

Standards-Based Grading Pilot

A high school Spanish teacher was given the opportunity to pilot a standards-based grading system in which grading was based on student mastery of learning standards on performance assessments. Mastery of each standard was graded on a four-point scale, and students could retake assessments until they achieved a score of a three or four on a standard. The teacher emphasized the importance of students needing additional time for learning and mastery of the material as more important than getting it right the first time around. Additionally, the teacher no longer (or rarely) assigns homework. The no-homework approach has helped the focus to be on classroom learning. Parents have been receptive to the new grading approach and believe that it is more reflective of how adults are evaluated in the workplace.

The standards-based grading approach was the teacher's idea. She and another world language colleague researched the idea and presented it to the school administration, who were extremely supportive. From there, they needed to make sure the district's grading system could support this approach. While this approach was just in its pilot phase, the teacher hoped that more world language teachers in her department could implement it the following school year.

This has been a mantra that I've learned the hard way: try one new thing a semester or a year. Push yourself in a new direction just by one thing. That may slowly get you to moving in a direction that you never thought you could go. I think we can all handle one thing, but if you try too many things, they fall off your plate.

...By learning alongside students. A math and science teacher who encouraged his school to invest in 3D printers described the importance of being willing to learn alongside students to successfully improve instructional practice. This teacher learned the software and was part of the learning process alongside students as they used the new technology. He said, "I'm big, personally, on being part of the learning process. I'm not afraid to say to a kid, 'I don't know.'" Some district leaders were beginning to move towards professional development models in which teachers were treated as learners in order for teachers to not only understand what it's like to be a student, but also to feel more comfortable as learners themselves.

Teachers can review, revise, and improve their instructional practice by:

- Trying one new practice at a time; not taking on too many changes at once
- Being willing to learn alongside students

Challenge and Engage Students

Many teachers often struggle with finding ways to connect and engage students in deeper learning. The following suggestions are rooted in examples of ways in which teachers have been encouraging students to engage in a "productive struggle" to solve problems, by drawing connections to real-life and current events, and doing in-depth dives into topics to allow students to explore a topic in greater depth from both a local and global perspective.

Teachers can challenge and engage students...

...By encouraging a "productive struggle." Teachers described shifts in their practice to intentionally challenge students. One teacher described this practice as encouraging a "productive struggle." Some teachers have started to purposefully allow their students more time to answer questions in order to explore concepts more fully and arrive at answers on their own. One math teacher explained:

One of the challenges is just stepping aside and letting those conversations happen, and not chiming in, and knowing when they need help and when they need to struggle. A quote that I wish was painted on my border would be something to the effect of "If you're not uncomfortable, then you're not learning". Because they're now to a point in their high school math career where a lot of this content is new, and so it's not as easy as drill and practice. It's making those connections and really struggling.

Another math teacher described her practice of deliberately not telling students the correct answer until multiple students in the class had the opportunity to share their answers. This teacher wanted to motivate all students to participate and become more confident by creating a safe space where they could be correct or incorrect yet engaged with the learning process.

In another example, a chemistry teacher experimented with not providing students step-by-step instructions to a lab assignment in hopes that it would help them to engage with the material and remember what they learned. She concluded, "They struggled with it, but I felt like that was a good thing, because that meant they were thinking about it, as opposed to just following the steps that I told them."

A school administrator, who was leading a collaborative planning session on how math teachers could incorporate more critical thinking into their instruction, noticed that the teachers did not give students enough time to think through problems before interjecting with an answer. She provided teachers with a list of question stems that teachers could use to help students think through their answers whenever they were stuck on a problem.

...By drawing connections to real-life and current events. Teachers in social studies classrooms described using the political landscape of the 2016 presidential election as an opportunity to teach their students how to properly consume news, contextualize information, and look for corroborating sources before making judgements. In a government class, the research team observed a lesson about health insurance, and students were assigned a two-day project to design a system to deliver healthcare to uninsured citizens.

In English classrooms, teachers were finding ways to make fictional literature more relevant to students' lives by drawing connections to current individuals, issues, and events. One English teacher described pairing *Fahrenheit 451* with contemporary articles about censorship. She explained, "The idea is you're looking at themes that occur in literature, and then how they apply to the real world as well, so that students understand that what they're reading is actually applicable to what is happening in the real world, their real lives."

In another English class, the research team observed a teacher preparing the class to perform parts of the play, *Oedipus Rex*. The teacher discussed the importance of making the play more relatable and understandable to students' lives through performance. In preparation, she showed the students a video of a poet reciting a poem about his mixed race of being white and Latino. The students and teacher brainstormed what to look out for in the performance: position, costume, facial expression, tone and volume, body gestures, props, scenery, sound, lighting, pacing and speed. After the video, the students completed a worksheet in which they were asked to reflect on the speaker's message and how his performance techniques enhanced or detracted from his performance. As a class, they discussed not only the poet's performance techniques but also the relatability of the poet.

The research team also saw many examples of incorporating real-world applications into science and math classes. For instance, a chemistry teacher related a Kool-Aid lab on solutions and molarity to medicine. She explained to students the real-world implication of needing to get concentrations of solutions precise in the medical world. After the lab, the teacher explained:

When I plan my lessons, I try extremely hard that every day, when they're learning something new, that they have a real application.... Across the district, that's been more of a push to make sure that what you're teaching is relatable. When I come up [with] the plan, there's an actual skill that they need to know to go forward, to help them in their future.

Also, in a biology class, a teacher gave students a real-world scenario in which students were asked to imagine that they had a friend whose baby brother had a genetic disorder. In small groups, students were instructed to design a poster and a video for their friend that explained the enzyme reaction and the influence of the misshapen enzyme. In math classrooms, rather than simply requiring students to write formulas and plot graphs, teachers provided real-world scenarios (i.e., calculating savings) and asked students to not just solve the mathematical equations, but also communicate their results through writing.

...By going deeper and exploring a topic from different lenses. Several English teachers described a general shift in their practice away from cramming in multiple fictional works each quarter or semester to grounding instruction around thematic units based on one text and incorporating related supplementary fictional and non-fictional pieces. As an ELA coordinator explained, "Within the realm of English Language Arts, we were very much, as most schools are, literature-driven at the high school. For years, it was a race of how many novels can you teach?" Acknowledging that students often aren't either reading or fully engaging with so many texts, some educators have begun to shift their practice towards anchoring an entire unit around one text, with different layers built in to help students engage more deeply. Additionally, new standardized assessments and college admissions standards have provided an extra push towards analyzing non-fiction, which has encouraged supplemental readings related to an anchor text.

In one tenth-grade English class, a teacher planned an entire year around the concept of heroism. The class had a strong research component in which the teacher incrementally provided structure yet autonomy for students to follow a line of inquiry that held the most interest to them. In the first semester, students read the non-fiction text, *Into the Wild*, accompanied by relevant opinion pieces in order to learn how to determine bias and formulate their own opinions on heroism. The teacher was planning a second-semester unit grounded in the novel, *All Quiet on the Western Front*. In addition to reading the novel, the class would visit a local museum and continue to explore the concept of heroism, especially heroes whom society fails to recognize. By the end of the unit, the teacher expected that students would conduct research around this general theme of heroism, culminating in high-quality projects such as documentaries or websites.

In another tenth-grade English class, a teacher described how she planned her lessons around theme-based units in order for students to find more relevance in their learning by exploring a topic through multiple lenses, including visually, historically, and artistically. When planning theme-based units, the teacher considered what types of literature her students would enjoy, and then designed the content and curriculum to make sure it simultaneously covered multiple genres and learning objectives. At the time of the visit, the teacher was finishing a unit on the Holocaust. Students read *The Book Thief*, Holocaust poetry, and historical non-fiction pieces. The class also visited a Holocaust museum. As a culminating project, students were working on two letters: the first letter to President Franklin Roosevelt about the Holocaust and the second letter to a contemporary leader on a current global issue. During the classroom visit, students were independently researching a current global issue of their choice and drafting their letters to a relevant public figure. One student was writing about treatment for mental illness and another was writing about hunger. This teacher engaged students by making connections to local and global issues in both the past and present.

...By providing opportunities for experiential learning. A math and science teacher described the value of providing experiential learning opportunities and incorporating hands-on experiential learning experiences into as many lessons as possible. For instance, the teacher explained that students were learning concepts not covered in the curriculum through the hands-on experience of designing airplanes and sailboats using 3-D printers. He said:

The nice thing I'm liking about this kind of stuff is that they are learning things without knowing that they are learning.... So they are learning about torque although it's not on our curriculum... even if they haven't labeled it with the name they are understanding what's going on.

In addition, the research team observed a math class in which the teacher brought in an ultrasonic motion detector with the ability to graph movement. This interactive activity engaged students in experiential learning by having them walk in front of the motion sensor and watch their graphs form in live time. The purpose of this activity was to provide students with a more meaningful learning experience applicable to the real world. Students took turns using the motion sensor to graph their movement. In addition to understanding graphs, students gained spatial awareness of distance and how much time it takes to go a certain distance.

At another school, the research team observed a physics class in which students learned the concept of power by running up a set of stairs and calculating their power in watts to understand the influence of weight on power. While activities such as this may be fairly common in science classrooms, they serve as a reminder of how students are not only more engaged but also better able to explain relationships between concepts when they experience learning firsthand.

Teachers can challenge and engage students by:

- Giving students time to think through answers and encouraging multiple responses
- Creating a safe learning space where struggling is encouraged
- Using current events and real-life examples to make learning more relevant by incorporating local and global perspectives into learning
- Providing examples that are relatable to students and offering experiential learning opportunities
- Anchoring learning around themes

Differentiate Instruction and Offer Flexibility for All Learners

Some teachers recognized the importance of identifying barriers and tailoring instruction to meet the needs of all students. In math classrooms, teachers introduced flexibility into their lessons by demonstrating to students that there are multiple ways to arrive at the same answer. Teachers also provided students with options and choices to demonstrate their learning: students chose subjects or topics of most interest to them, along with the multimedia through which they could present their work and communicate their learning.

Teachers can differentiate instruction and provide flexibility for all learners...

...By tailoring instruction. The school that implemented the Universal Design for Learning (UDL) framework recognized the importance of differentiation and moving away from a “one-size-fits-all” approach to learning. As the principal explained, “The whole idea is kids aren’t one-size-fits-all, teachers aren’t one-size-fits-all, schools are not one-size-fits-all. You have to be nimble enough to recognize: ‘How can I get these kids excited, how can I design my room to help me? How can I design this lesson?’” Teachers at the school described how the adoption of the UDL framework has helped them to think about where students might have difficulties and to plan accordingly in order to meet the needs of different students through differentiated instruction and use of resources.

One inclusion teacher at the school described how the UDL model helped her to address the needs of all students in her classroom. She explained:

For me, the framework of UDL has really helped me to address all the different learners in my classroom. UDL has helped me to create lessons where all students have access to the material regardless of where they’re starting. I think that has really helped with participation in the classroom. That’s why I really appreciated the framework. It allows all students to be engaged regardless of what they’re capacities are for learning.

The teacher said that the school’s adoption of the UDL educational framework has helped her to think about where she will have barriers and plan lessons accordingly to meet the needs of different learners. For instance, many of her students struggle with reading, so she purposefully incorporated multimedia and other forms of support (such as guided or annotated notes) into lessons in order to provide multiple representations of the material and help “break down the barrier of vocabulary.” She also engaged students by giving students flexibility and choice with regards to how many problems they need to complete to demonstrate mastery. For instance, she said that she may only require students to complete 10 out of 15 problems on a worksheet, and if they get a certain percentage correct (i.e., 90 percent), they do not have to complete the rest of the problems. She did not think it was necessary to expect all students to complete all problems if they were able to demonstrate mastery with fewer.

...By encouraging multiple ways to solve problems. In several schools, the research team saw evidence of teachers encouraging students to use multiple or varied pathways to solve problems, particularly in math classrooms. For example, a geometry teacher encouraged his students to think about the multiple theorems they could use to prove congruency of the same angle. In algebra classrooms, teachers also encouraged the use of different methods to solve problems and arrive at answers, such as through equations, tables, and graphs. In one algebra classroom, the teacher demonstrated the relationship between graphing scatter plots and trend lines and algebraic equations. She showed the students the similarities between solving an algebraic problem visually (i.e., using graphs) versus algebraically.

Some math teachers also infused writing into their math lessons by having students write sentences or paragraphs to communicate results. For example, in one algebra class, students were completing an algebraic problem about financial savings (i.e., if you start \$50 and save \$10 a week, how much money would you have in X number of weeks). The teacher encouraged students to pick intervals, plot the direction of the graph, build an algebraic equation, and then write a sentence describing it. He reminded students that there were multiple pathways to arrive at the correct solution as well as a variety of ways to communicate results.

***The Great Gatsby* Body Biography**

At one school, an AP English language and composition teacher and the art department teamed up on a culminating project. While reading *The Great Gatsby* by F. Scott Fitzgerald, the teacher emphasized studying the novel through the lens of rhetorical analysis, with the goal of determining Fitzgerald's argument about the American Dream and supporting it with textual evidence. After reading the novel, students completed a two-part activity with both a written and visual component. First, in small groups, students selected a central character and found relevant passages from the novel as well as external literacy criticisms that shed light on that character. In addition, they were instructed to research the historical and cultural context of the 1920s and to analyze the connection between the character and how the character responded to the American Dream of that era.

Then, students created a "body biography," a visual depiction using their choice of media. While this is something the English teacher had assigned in previous years, she wanted to make the activity more meaningful and give students a problem to solve. Since the school's art department had expressed interest in doing a cross-departmental project, the English teacher jumped at the opportunity. Acting as a cross-departmental team, the art and English teachers decided that students would create a split depiction of their chosen character: one depiction of the character from the novel from the 1920s and the other being a modern-day representation of that character highlighting the contemporary American Dream. Students were instructed to select their artistic expression (i.e., sketch, watercolor, collage, sculpture, etc.) and differentiate their form (i.e., through the use of lines, colors, symbols, etc.) to create their split depictions. Once completed, students were asked to present and give a brief analysis of their body biography, including the contemporary figure they chose to represent *The Great Gatsby* character contemporarily, as well as to show how they used art to convey their analytic interpretation of the American Dream.

A few factors contributed to the success of this cross-departmental collaboration on *The Great Gatsby* body biographies. The school had the needed resources to allow for this type of collaboration to occur: there were flex spaces for students to work on their projects, teacher substitutes available to provide release time to teachers, and a supportive school administration.

...By giving students choices and options. Teachers encouraged students to make their own decisions about their learning based on their interests, often giving students choices and options to demonstrate their learning. For instance, in an English class, students wrote to a current leader about a global issue they cared about. In a science class, groups of students were encouraged to choose a genetic disease of interest for a project on enzyme reactions. In a Spanish class, students completed a short biography on a missing person of their choosing from Argentina's Dirty War.

A prominent example of an opportunity for student choice was in a ninth-grade English classroom. Students were given an assignment to create a comic strip with a non-linear sequence that incorporated key terms and techniques of non-linear plots, including flash-back, flash-forward, foreshadowing, and dreaming. Students could write their own story or retell a story they already knew. The teacher provided examples from television and movies, and students chose which non-linear plot techniques to incorporate into their comic strip. Students were given the choice to design their comic strip on paper or to use a computer program called *Storyboard That*.

In other examples of problem-based learning assignments, students had the flexibility to present their understanding of material through preferred media. For example, an English and art teacher collaborated on a project in which students created "body biographies" or visual depictions that half-embodied a character from *The Great Gatsby* and half-embodied a modern-day figure with commonalities to the fictional character in order to portray the American Dream in both the 1920s and in the present day (see textbox on previous page for more details).

Teachers can differentiate instruction and offer flexibility for all learners by:

- Identifying barriers that students might encounter
- Approaching concepts through multiple modes of learning, including reading, writing, creating, and interacting
- Encouraging different approaches to problem-solving
- Giving students choices and options to demonstrate their learning

Conclusion

Increasing emphasis on deeper learning competencies in education has led to interest in how practitioners can incorporate deeper learning in their schools and classrooms. The strategies presented in this report can serve as a springboard for planning and improvement in other school districts, schools, and classrooms. Sharing these strategies provides an opportunity for system leaders, school leaders, and teachers to learn from the experiences of their peers in four districts and eight high schools that have participated in the OECD Test for Schools in the United States or PISA internationally.

This report presented what educators at each level of the system can do to promote deeper learning competencies, focusing on the supports provided as well as the challenges encountered, as summarized in the textbox.

There were some common strategies that stood out as being used by educators and leaders across levels of the system to strengthen instruction. System leaders, school leaders and teachers can all consider how to help students develop the competencies needed to succeed in a 21st-century global economy and society by: (1) communicating a vision for instructional improvement, (2) using data to inform instruction, (3) supporting teachers and school leaders in implementing new approaches, (4) taking steps towards establishing structures for effective collaboration, and (5) being willing to continuously improve practice to challenge and engage students. Together, these strategies point to practices that can be adopted by other system and school leaders and teachers, to help students develop the deeper learning competencies needed to be successful in today's world.

To strengthen instruction that promotes deeper learning competencies...

System-level leaders can...

- Communicate a system-wide vision by aligning around a common framework or strategy and by getting buy-in from school leaders.
- Collaborate across different departments and levels of the system to ensure coherence in policies supporting this framework for instruction.
- Support professional planning and growth for teachers through policies that provide structured time to collaborate, by providing coaches and other direct supports, and professional development that is grounded in classroom practice.

School leaders can...

- Use data to inform a school-wide instructional improvement strategy and identify group(s) of students needing targeted instructional interventions.
- Articulate shared expectations and strategy for instructional practice throughout the school.
- Encourage teacher-led change and providing opportunities for teachers to co-plan and observe each other.
- Place assistant principals and deans in instructional leadership roles to provide feedback to teachers.
- Maximize available technology to engage students in learning.
- Ensure continuity with feeder middle schools by discussing vertical articulation of curriculum and accuracy of student placement decisions, and by providing opportunities for middle school teams to visit high schools.

Teachers can...

- Review, revise, and improve their skills and instruction by trying one new thing at a time and being willing to learn alongside students.
- Challenge and immerse students in learning by encouraging them to productively struggle, drawing connections to real-life and current events, exploring a topic from different lenses, and providing opportunities for experiential learning.
- Engage students with varying learning styles by tailoring instruction, encouraging multiple ways to solve problems, and offering choices and options.

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Appendix A-Guiding Questions and Study Methods

Guiding Questions

This study sought to better understand and document the instructional practices and strategies used by teachers and principals in schools to support instructional improvement. In addition, the research team explored the school- and system-level supports provided as well as the associated challenges encountered by educators at every level: within the school system, schools, and classrooms.

Study Methods

PSA worked with America Achieves and The Center for Global Education at Asia Society to select districts that had participated in the OECD Test for Schools (in the U.S.) or PISA (internationally) to participate in the study based on their experience and level of participation with these tests and the Global Learning Network through America Achieves and Global Cities Education Network through Asia Society. Three U.S. districts and one Canadian district were selected. Of the three U.S. districts, there were two suburban districts and one urban district. The Canadian district was a large, urban district.

The PSA team worked with a school district employee to determine two high schools within each of the four districts to visit that were preferably of approximately similar sizes and of similar demographic compositions. Prior to site visits, PSA talked to district and school staff in order to understand the work being done around the OECD Test for Schools or PISA, changes in instructional practices, and contextual factors that facilitated or inhibited instructional improvement efforts. The purpose of these initial conversations was to tailor the data collection approach according to each district and school's particular context.

A team of two PSA researchers conducted 2- to 2-1/2- day site visits in each district from October 2016 to April 2017. At each school, PSA researchers conducted interviews with classroom teachers, support staff, and school administrators and observed classrooms and/or instructional planning time. Additionally, PSA researchers interviewed central office staff including the individual responsible for overseeing participation in the OECD Test for Schools, curricula directors, and content-specific coordinators. In the Canadian district, PSA researchers also interviewed a provincial-level representative. In total, PSA researchers interviewed a total of 16 system-level staff and 42 school staff across the four districts and eight schools. PSA researchers conducted a total of 34 observations, including 30 classroom observations and four observations of instructional planning time.

