



Deeper Learning Infrastructure Support *Toolkit Introduction*

The twenty-first-century economy requires students to graduate with a set of competencies necessary for post-secondary learning and the workforce. High schools are positioned to support all students in gaining these competencies. In high schools where students are engaged in developing deeper learning outcomes—mastering academic content and applying that knowledge to think critically and solve complex problems; working collaboratively; communicating effectively; self-directing their learning and incorporating feedback; and developing mindsets necessary for learning—leaders may want to consider how the school infrastructure supports this type of learning. Leaders should recognize that while resources might be limited, small adjustments to space, time, technology use, and other infrastructure supports can strengthen opportunities for all students to engage in deeper learning.

For example, a superintendent might meet with principals to discuss and share new approaches to scheduling time that would allow for more hands-on and real-world projects. Ideas might include using advisory periods for project-based activities with business and community experts serving as guest speakers or mentors, spending lunch periods sharing high-quality sample projects, and promoting cross-school discussion and sharing through various media during after-school time. School leaders can learn from others who are more experienced in deeper learning by visiting other places, holding conference calls, participating in webinars, and reviewing websites for ideas. Hearing from students, teachers, parents, and others also can provide opportunities to think about

and adjust infrastructure for more meaningful teaching and learning.

School leaders who are trying to strengthen infrastructure so that all students across their secondary schools (including traditionally underserved students) have access to deeper learning may benefit by considering the following questions:

- What infrastructure is currently in place to support deeper learning?
- How can students and teachers collaborate with leadership to make changes?
- What changes in infrastructure (e.g., time, schedule, transportation, technology, space, professional development, etc.) might allow for more collaboration among students and teachers within classes, across content areas, and across levels?
- Can schools make small changes in infrastructure that will open up more opportunities for students to participate in business- and community-based activities?
- What changes in the current use of physical space might support more group projects, independent study, research, student-to-student discussion, teacher and student interaction, and extended-learning tasks?

Answers to such questions may help leaders at the school and district levels ensure opportunities and access for all students, especially when particular attention is paid to student groups that may require different resources than the general population. This does not mean always turning to the budget for more money; it might mean seeking

new ways to increase the teacher and student sharing of the resources that are already in place.

Students with disabilities might require adaptive technology, and students learning English as a second language might require programs and assessments to augment their core curriculum. How can these resources be made available, and in ways that support students' mastery of rigorous content and acquisition of deeper learning?

While there are many opportunities for districts to rethink the infrastructure from a deeper learning perspective, there are three areas that can provide a good start:

- sufficient time;
- technology availability; and
- adequate space.

In each of these areas, professional development serves an important role in ensuring educator capacity to implement approaches.

Reorganizing and Rethinking Time

Time in comprehensive high schools often is organized by traditional class periods. Revisiting all scheduled time (before and after school) is one way school leaders might build a deeper learning environment. For example, to maximize instruction for deeper learning outcomes, class periods might include

- extended blocks of time for personalized and project-based learning;
- co-developed interdisciplinary instruction and assessments;
- use of the media center time with support from the librarian to enhance and expand opportunities for project-based learning; and
- a redefining of how school counselors and other resource personnel use their time to support community-based and work apprenticeship opportunities.

In making these decisions, leaders also might consider how time during and after school, as well as teacher planning time, is organized so teachers and students can discover ways to support their own development.



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There are multiple ways in which schools can strengthen time for deeper learning:

- Time is scheduled for students to present their projects to peers, family, and community representatives.
- Students work in small groups over several days to apply what they are learning to solve real-world problems in their community.
- Time is scheduled or adjusted so students can participate in forums in which business and community leaders engage students in round table discussions. Teachers participate or use this time for personalized professional learning or other professional development activities.
- Time is scheduled intentionally for peer-mentoring activities throughout the week.
- Time is blocked per week for student-directed learning activities, in which students work on their learning goals, assess their progress, and take other steps to manage their own learning.
- At the beginning of the semester, or at other scheduled times, students research areas of interest and develop personalized learning goals.
- Students engage in internships and service-learning activities on a regular basis.

In some cases, policies and procedures regarding how time is organized may need to be revised to develop a school culture that embraces deeper learning. Orchestrating some of the time shifts may require changes such as early dismissal, a late start, time on and off campus,

in-class or virtual learning time, and other machinations of time for students and teachers to build community partnerships and experience real-world applications of what they are learning in school.

Ensuring Efficient Infrastructure for Technology

Technology can foster deeper learning in a number of ways. For example, the Internet vastly expands students' capacity to conduct research that can deepen their background knowledge and build critical thinking about the sources they investigate and for what purpose. Technology can enable students to collaborate with peers across the globe through a wide range of communication tools. Schools that are not fully equipped with staffing expertise for all subject areas (such as foreign languages) can share resources by scheduling virtual classrooms. Students may use

- computers to research information, work collaboratively on a shared workspace, and prepare a report or project;
- software to prepare graphics and multimedia software for presentations; and
- spreadsheets and analytic tools to compose research findings.

In addition, many students develop agency for their own learning, directing their college and career pathways and enjoying learning by combining technology-based tasks with the support of teachers, field experts, family members, and classmates.

Technology also can enhance students' ability to demonstrate what they know and are able to do with the information they have learned in ways that signify their readiness for postsecondary work. Technology may capture creative skills, foster retention of information, and increase the ability of students to participate in interactive performance tasks.

When educators use technology to connect in-school curriculum with out-of-school interests and real-world issues, students often become excited about learning and begin to see how what they are learning in school connects to the world around them. Being able to apply what is learned in school to real-world situations is critical for

college and career readiness and also for success in life. Students may become more actively involved in shaping their learning pathways, career, and life by using technology to strengthen their role in the learning process. Connecting these learning environments can be facilitated by a strong digital infrastructure. Supportive policies that help to build a comprehensive digital infrastructure that supports deeper learning include

- investment in ongoing, consistent, and relevant formal and informal professional learning needed for educators to make necessary pedagogical transformations;
- digital tools and approaches paired with robust content and teacher capacity to implement a well-articulated plan for fostering digital citizenship through continuous improvement;
- assessment and data systems that facilitate individualized, personalized, and collaborative learning opportunities that are geared toward the application of learning; and
- engagement of parents and community partners in cultivating anytime, anywhere learning opportunities that extend beyond the school day.

Equitable distribution and adoption of technology learning systems, tools, and approaches go hand in hand with increased Internet access in and out of school. Ultimately, technology only creates the opportunity for achieving the types of outcomes necessary for college and career readiness; the *total* infrastructure is what translates opportunities into outcomes.

According to Bob Wise, president of the Alliance and former governor of West Virginia, "Traditionally, when educators think about digital infrastructure they see only computers, wires, and high-speed Internet connections. While these basic components are vital, they do not guarantee academic success. The comprehensive digital infrastructure can support the shifts in instructional practice and professional learning that really make a difference in student learning."

Providing Adequate and Innovative Use of Space

Given the dramatic changes in how we learn and work in the twenty-first century, the idea of redesigning students'



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learning spaces should move from theory to practice. How can schools transform teacher-centric classrooms into dynamic learning spaces that leverage the power of collaboration and idea sharing, supported by technology to enhance real-world learning and student agency? Following are a few ideas that districts are implementing when redesigning space for deeper learning. In many cases, redesign does not require a major overhaul of physical space.

Some districts are turning their libraries, unused closets, outdoor spaces, and classrooms into open, collaborative learning areas that better reflect an environment that fosters deeper learning. Open space provides students with multiple areas to plan, discuss, share, and conduct the various tasks that may be required for assignments and projects. Portable walls can be used to create temporary smaller spaces for group or individual activities. Providing charging stations in various locations—including in cafeterias and hallways—can help make learning efficient and pleasant.

Libraries can be redesigned to include reading labs, sound studios, and collaborative areas. Working with partners to use authentic spaces in the community—such as a hospital or clinic for biology, a farm for earth science, and a theater for the performing arts—can create interest and motivation. Other examples of redesigned space include

- putting desks together to form large tables where students see each other as they exchange opinions and ideas, as well as develop and present projects;

- allowing students to use detachable whiteboards in different settings;
- providing quiet space in one corner of a classroom to facilitate Skyping or other online video chat sessions with experts outside of the school community or from one classroom or workspace to the other; and
- removing the teacher's desk and using the space for ongoing collaboration with students throughout the day.

While *makerspaces*—locations where students make or produce items—might not be the norm, schools that are using them for deeper learning can expand them by providing students with opportunities to explore their own interests and to apply knowledge. This approach promotes ongoing collaboration with experts who can help students from various backgrounds and with diverse interests work together toward a common goal. Makerspaces encourage thinking, provide experience, teach problem solving, and allow students the opportunity to create or recreate something on their own. As an instructional approach, makerspaces encourage students to solve problems by tinkering, building, inventing, or otherwise creating physical or digital artifacts. Some makerspaces are digitally based; others are physical spaces focused on science, fine and performing arts, and other subjects. For a school district example, see <http://deeperlearning4all.org/deeper-learning/making-an-impact-one-districts-approach-to-deeper-learning>

Resources

Teaching for Deeper Learning for All Students (Webinar)
(February 2, 2016)

<http://all4ed.org/webinar-event/feb-2-16/>

In this webinar, hosted by the Alliance and the National Commission on Teaching & America's Future (NCTAF), panelists explore the conditions needed to support great teaching for deeper learning. Discussion focuses on a vision for deeper learning and the teaching to support it. It explores research and best practices that support educators in providing all students with opportunities to develop the competencies they will need to succeed in the future. Panelists take an in-depth look at building a culture of collective responsibility to ensure that all students

have access to deeper learning. They also discuss creating conditions to support deeper learning, including new roles for teachers and the allotment of sufficient time for professional learning and collaboration.

Learning Spaces Design: Creating Spaces That Work for Kids (Webinar) (December 3, 2015)

<http://all4ed.org/webinar-event/dec-3-2015/>

In this webinar, Pamela Moran, 2016 Virginia superintendent of the year and one of four national finalists chosen by the American Association of School Administrators for its 2016 Superintendent of the Year award, shares her district's experience in transforming learning spaces and how these changes have impacted teaching, student learning, and district culture. She describes how all areas within the school—classrooms, hallways, libraries, gymnasiums, and other spaces—can be redesigned to accommodate project-based learning and deeper learning outcomes. She also extends the redesign outside classrooms, from the school grounds to the larger community, including equipping school buses with wi-fi.

Redesigning Learning Spaces: Creating Brain-Friendly, Blended Learning Environments (Webinar) (September 17, 2014)

<http://all4ed.org/webinar-event/sep-17-2014/>

This webinar provides concrete examples of how the learning environment impacts student learning and how a classroom or building makeover may be all that is needed to take student achievement to the next level. It also provides information and real school examples to assist in redesigning a classroom into one that considers brain research, gender, and digital impacts on learning.

Beyond the Field Trip: Connected Learning in Museum Spaces (Webinar) (May 8, 2014)

<http://all4ed.org/webinar-event/may-8-2014/>

Increasingly, museums are going beyond the field trip to become hubs of learning, innovation, and creativity. This webinar focuses on the American Museum of Natural History in New York City, which is working with young people to build video games to complement new exhibits, using *Minecraft* as a springboard to science, and creating other learning opportunities that encourage students to

explore their interests. Panelists provide perspectives on ways learning can take place in museums and other out-of-school places, and share how educators can both integrate museum resources into their teaching and be inspired to try different approaches in their own classrooms.

Transforming Spaces to Transform Learning: Connected Learning in Action (Webinar) (April 3, 2014)

<http://all4ed.org/webinar-event/apr-3-2014/>

This webinar features the transformation of the Elizabeth Forward School District in Pennsylvania. Among the changes, librarians have been transformed into learning facilitators, beanbag chairs have replaced study carrels, and the library is now a more casual learning environment, where students can grab a beverage, explore a new technology, discuss projects with friends, and work with mentors. Students can use innovative technologies to explore their interests and connect their experience to what they are doing in the classroom. The district's Simulated Multimedia Arts Learning Lab creates a kinesthetic learning environment that supports full-body games and new ways to experience and explore abstract concepts. The district also incorporates game design into the curriculum to support science, technology, engineering, and mathematics (STEM) outcomes. The district assistant superintendent provides insight into how these new learning spaces were created and supported, and how students and teachers have responded.

Technology, Training, and Teaming to Ensure Great Teaching for All Students (Webinar) (August 25, 2015)

<http://all4ed.org/webinar-event/aug-25-2015/>

Technology has the potential to transform the teaching profession, increase opportunities for collaboration and professional learning, and improve student learning. In this webinar, panelists share data and experiences and discuss digital best practices to build teachers' expertise and their ability to create powerful learning environments for their students. The discussion covers what opportunities exist now and will exist in the near future for using technology to support great teaching, how research results can be connected with what is happening in practice, and what recommendations should be put forward regarding technology integration and policy.

Creating Anytime, Anywhere Learning for All Students: Key Elements of a Comprehensive Digital Infrastructure
(June 2014)

<http://all4ed.org/wp-content/uploads/2014/06/DigitalInfrastructure.pdf> June 2014

Connecting the nation's schools and libraries to the Internet by modernizing and expanding the federal E-rate program currently dominates education technology efforts, but this report urges that adequate broadband access be accompanied by a comprehensive digital infrastructure that unlocks the potential technology to enhance student learning. The report adopts a broader definition of digital infrastructure that includes professional learning, changes in pedagogy, parent and community engagement, and assessment and data systems. A summary of the report can be found at <http://all4ed.org/articles/creating-anytime-anywhere-learning-for-all-students-comprehensive-digital-infrastructure-must-include-changes-in-teaching-practice-professional-learning-assessment-and-other-key-elements-says-ne/>

Every Student Succeeds Act Primer: Digital Learning
(April 26, 2016)

http://all4ed.org/wp-content/uploads/2016/04/FINAL_ESSA_FactSheet_DigitalLearning.pdf

This one-page brief summarizes the opportunities in the Every Student Succeeds Act that support digital learning and the effective use of technology.

Blended Learning: Recommendations and Resources
(Webinar) (July 28, 2016)

<http://all4ed.org/webinar-event/jul-28-2016/>

Blended learning is the integration of in-person learning with technology to enable the use of real-time data, personalization, and competency-based progression. In this webinar, panelists

- share solutions to top barriers (e.g., Internet connectivity, device purchasing, communication with constituents, teacher instructional competencies, monitoring progress) to implementing blended learning;
- offer a historical body of evidence supporting the effectiveness of personalized learning and learning for mastery, both of which blended learning can enable at scale; and
- introduce a five-step guide for districts to develop a blended learning measurement system of their own.

Tools in this Toolkit

Following is a list of tools contained in this toolkit. Each tool listing contains a title, the intended audience (SL = state leader; DL = district leader; and SDL = state and district leaders), and the purpose of the tool.

- **Digital Infrastructure: A Look at What Districts Are Doing** (SDL)
The purpose of this tool is to learn how selected districts are addressing digital infrastructure in support of deeper learning.
- **Do We Have Space for Deeper Learning?** (DL)
The purpose of this tool is to provide an opportunity to reflect on how school space is organized and how it might be redesigned to support deeper learning.
- **Educator Capacity to Use Technology for Deeper Learning** (SDL)
The purpose of this tool is to provide state and district leaders with an opportunity to consider the importance of building educator capacity to use technology for deeper learning.
- **Making Time for Teacher Professional Learning** (DL)
The purpose of this tool is to review how time is organized for teachers to engage in professional learning and capacity building.
- **Opportunities in ESSA that Support Digital Learning** (SDL)
The purpose of this tool is to focus attention on the opportunities in ESSA that support digital learning and to discuss possibilities in the state and/or district.
- **Organizing Time for Deeper Learning** (DL)
The purpose of this tool is to think about how time is currently organized in support of deeper learning.
- **Reviewing Your District's Technology Infrastructure** (DL)
The purpose of this tool is to provide an opportunity to think about your district's technology infrastructure and to discuss how it might be enhanced to support deeper learning.
- **Scaling Up Technology** (SDL)
The purpose of this tool is to encourage conversation related to issues raised when scaling up technology in the district.

