## Instructional Technology Initiative Task Force RECOMMENDATIONS

A shared vision and ideal practices to support instructional technology efforts District-wide

Online version of this report



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# Acknowledgments

The Los Angeles Unified School District (LAUSD) is committed to preparing all students to lead and succeed in a 21st century world. Many may be familiar with the District project that brought 1:1 digital learning tools (a device for each student and teacher) to more than 75,000 students and 4,400 teachers since July 2013 to enhance teaching and learning. Building from those projects' successes and lessons learned, a task force was convened to provide instructional recommendations to inform future instructional technology efforts.

The Instructional Technology Initiative (ITI) team, headed by Sophia Mendoza, Director, would like to thank the Board of Education and Superintendent Michelle King for their continued support throughout this endeavor. Special consideration to former Superintendent Ramon Cortines who spearheaded these efforts alongside former Chairperson Dr. Judy Burton. The ITI team also extends their deepest gratitude to Dr. Frances Gipson, Task Force Chairperson and Chief Academic Officer, for her innovative leadership and for ensuring the task force work remained focused on students.

This report was made possible by the passion and commitment of the following innovative educational leaders:

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We also extend our deepest gratitude to our external partners and guest speakers who took the time to share their learnings with our group.

# **Executive Summary**

This report is comprised of instructionally-focused concepts with supporting infrastructure suggestions for the Board's consideration. In order to prepare L.A. Unified learners for today's world, the recommendations that follow are founded on providing personalized learning opportunities for all learners. Thus, the recommendations propose a shift in instructional paradigm: effective instruction necessitates technology. If educators are not leveraging technology, how will students be best prepared for today's increasingly digital world? How can students be expected to excel in higher education environments or effectively launch their careers without exposure to digital tools? More importantly, how can teachers effectively meet each student precisely where they are without digital tools to help them identify areas of instructional need? Personalized learning cannot occur in the District's current instructional model unless educators begin leveraging the many opportunities afforded by digital tools to promote learner agency and academic rigor.

This report is comprised of the following sections:

Introduction: This section provides the framing necessary to understand the proposed recommendations, which requires an instructional paradigm shift.

Foundations: This section highlights two resources that played an integral part in the development of each recommendation and the infrastructure requests needed to support a 21st century instructional shift.

Recommendations: This section outlines the instructional recommendations put forth by the ITI Task Force, which were developed to lead subsequent infrastructure decisions. Recommendations were informed by a great deal of discussion through independent workgroup efforts and collaborative task force learning experiences.

Grade Span Examples: This section provides classroom examples that demonstrate how instructional activities can be designed to address the aforementioned recommendations while helping students meet International Society for Technology in Education (ISTE) standards in elementary and secondary settings.

Infrastructure Support: This section identifies District infrastructure needs that must be fulfilled to support the proposed instructional recommendations.

The task force was carefully selected to ensure broad stakeholder representation from students, parents, and teachers to District administrators and community members. Funding Options: This section provides a summary of funding models that can be considered by the District to support effective instruction by leveraging digital tools.

District Efforts: This section outlines the District's current efforts to develop an effective and sustainable model to implement personalized learning practices with digital learning tools.

Glossary: This section defines keywords that are essential to understanding the full extent of each recommendation and their implication for cultivating a District-wide culture that supports personalized learning for all learners.

Each recommendation and infrastructure support identified were based on discussion, research, and hearing directly from District stakeholders. Two key resources that informed this work were the 2015 National Education Technology Plan (NETP) and the 2016 ISTE Standards for Students. The 2015 NETP provides the vision for instructional technology nationwide, highlighting the potential of technology to amplify instructional practices and address matters of equity and accessibility. The 2016 ISTE Standards for Students were designed by educators across the nation representing a variety of curricular background and grade levels.

Six instructional recommendations were developed around three core principles: learner agency, academic rigor, and learner-centered learning environment. Below are the instructional recommendations and the infrastructure supports needed to support the instructional vision:

#### Instructional Recommendations

Recommendation 1: Enact a continuum for achieving learner agency for students and school leaders.

Recommendation 2: Support teachers in exploring curricular content that is interdisciplinary and provides authentic, real-world application. Recommendation 3: Support personalized learning initiatives District-wide. Recommendation 4: Integrate a learning management system (LMS) in support of a learner-centered learning environment.

Recommendation 5: Design and deliver learner-driven professional learning opportunities for school leaders, teachers, students, parents, board members and community and business leaders.

Recommendation 6: Develop and adopt District-wide tools to measure lesson effectiveness.

Three levels of support are needed to carry out each instructional recommendation: personnel support, resource support, and parent support.

#### **Infrastructure Needs**

Need 1: Ensure students and educators have broadband access to the internet and adequate wireless connectivity at school.

Need 2: Establish a baseline minimum that every learner has access to at least one device that connects to the internet.

Need 3: Ensure interoperability between a District-wide Learning Management System (LMS) and the District information technology system. Need 4: Ensure District leaders understand and adopt a change management approach to leveraging digital tools and resources for instruction.

Need 5: Repurpose staffing according to the instructional goals and vision to achieve personalized learning.

Need 6: Implement a process for consistent annual review and update of related policies that support the instructional vision of personalized learning. Need 7: Establish pathways for collaborative partnerships between the Division of Instruction and key departments within the District.

In order to provide access to digital learning devices District-wide and realize the vision of the ITI Task Force recommendations, the following funding models were discussed:

- Bond Funds
- Textbook Funds
- External Partnerships
- Leasing Devices
- Bring-Your-Own-Device (BYOD)

To support the instructional paradigm shift outlined in the recommendations above, L.A. Unified has taken necessary steps to begin the shift towards personalized learning and effective integration of digital learning tools. Current efforts have included:

- Education Technology Grant Program
- Shared-Use Device Protocols
- Online Gradebook Pilot/Learning Management System
- School Instructional Technology Plan
- Summer Professional Development Institute
- Online Course Offerings
- Ongoing 1:1 School Support
- Digital Citizenship Curriculum Development

Each recommendation and infrastructure support identified were based on discussion, research, and hearing directly from District stakeholders. Please note this hard copy version of the report is out of date as soon as it is printed. In recognizing the dynamic nature of digital learning, the ITI Task Force recommendations will live on a platform called Scalar, which is a media-rich publishing platform aimed at creating an interactive reading experience. With Scalar, each recommendation will be annotated with videos, pictures, and research to help readers develop a comprehensive understanding of what it will take to enact personalized learning Districtwide. The digital counterpart to this report will be available at the following link: www.tinyurl.com/ititaskforce.



If educators are not leveraging technology, how will students be best prepared for today's increasingly digital world?

# Foreword

The purpose of the Instructional Technology Initiative (ITI) Task Force was to collectively research and identify a shared vision and ideal practices to support instructional technology efforts District-wide. Upon establishing a common, shared vision, the District will be better positioned to make informed instructional technology and infrastructure decisions moving forward. Convened in April 2015 by former Superintendent Ramon Cortines, the task force was carefully selected to ensure broad stakeholder representation from students, parents, and teachers to District administrators and community members. Recommendations were informed by a variety of task force efforts. For example, task force meetings were designed as collaborative learning opportunities to hear from both District stakeholders and leading education technology experts. In smaller workgroup meetings, members engaged in activities such as reviewing relevant research, examining similar efforts in neighboring Districts, and exploring national education technology standards.

When the group first came together, members were passionate about ways to change the narrative and ready to make recommendations. To ensure the quality of collaboration and task force outcomes, Dr. Gipson, Task Force Chairperson, advocated for setting time for learning as a community to capture the group's best thinking. Thus, the task force work progressed along the following timeline:

Timeline	Milestone
October - November 2015	Learning, Leading, & Immersing
December 2015 - January 2016	Discussion & Drafting
February 2016 - March 2016	Member Checking
April 2016 - May 2016	Writing
June 2016	Board Review

Meetings structures and methods of capturing members' work were hybrid in nature, modeling ways digital tools could be used for collaborative activities alongside traditional methods. Feedback was elicited at each meeting, and each meeting was designed to provide a dynamic learning and immersing experience. Together, members developed and refined recommendations aimed at providing a robust instructional technology learning experience for all learners. If educators are not leveraging technology, how will students be best prepared for today's increasingly digital world? Understand that 1:1 learning environments provide the optimal personalized learning environment, but also recognize the multiple device ratios that are appropriate for various instructional goals. This report is comprised of the following sections:

- Introduction: This section provides the framing necessary to understand the proposed recommendations, which require an instructional paradigm shift.
- Foundations: This section highlights two resources that played an integral part in the development of each recommendation and the infrastructure requests needed to support a 21st century instructional shift.
- Recommendations: This section outlines the instructional recommendations put forth by the ITI Task Force, which were developed to lead subsequent infrastructure decisions. Recommendations were informed by a great deal of discussion through independent workgroup efforts and collaborative task force learning experiences.
- Infrastructure: This section identifies the infrastructure needs that must be fulfilled to support the proposed instructional recommendations.
- Funding Options: This section provides a summary of funding models that can be considered by the District to support effective instruction leveraging digital tools.
- District Efforts: This section outlines the District's current efforts to implement an effective and sustainable model to implement personalized learning practices with digital learning tools.
  - Glossary: This section defines keywords that are essential to understanding the full extent of each recommendation and their implication for cultivating a District-wide culture that supports personalized learning for all learners.

## Introduction

This report is comprised of instructionally-focused concepts with supporting infrastructure suggestions for the Board's consideration. In order to prepare L.A. Unified learners for today's world, the recommendations that follow are founded on providing personalized learning opportunities for all learners. Thus, the recommendations propose a shift in an instructional paradigm: effective instruction necessitates technology. If educators are not leveraging technology, how will students be best prepared for today's increasingly digital world? How can students be expected to excel in higher education environments or effectively launch their careers without exposure to digital tools? More importantly, how can teachers effectively meet each student precisely where they are without digital tools to help them identify areas of instructional need? Personalized learning cannot occur in the District's current instructional model unless educators begin leveraging the many opportunities afforded by digital tools to promote learner agency and academic rigor.

The recommendations are founded upon creating a learning environment where learner agency and academic rigor are possible. Learner agency is defined as learners being self-directed, engaging as both consumers and producers of knowledge. Academic rigor is defined as instructional experiences that encourage computational thinking, allow learners to struggle through and organize abstract information, and which provide real world connections where learners can actively apply their knowledge to circumstances beyond the classroom. Such a learning environment is facilitated by a learning management system (LMS), where educators can design lessons that are collaborative and personalized to meet students where they are in their learning.

Supporting the learning environment for effective instruction as defined in these set of recommendations requires forward-thinking leadership and the management of change District-wide. Thus, the following recommendations would not be possible without acknowledging the leadership expectations and change management models needed to inform infrastructure decisions, steer parent involvement, and support such a paradigm shift among school leaders. Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.

## **Leadership Expectations**

The following leadership expectations were developed to demonstrate the importance of leadership buy-in and support when addressing a paradigm shift. Leaders who are committed to cultivating learner agency using digital tools:

- Identify a leadership team that deeply embraces and creatively pursues personalized learning.
- Develop a culture where teachers are facilitators of knowledge.
- Understand that 1:1 learning environments provide the optimal
  personalized learning environment, but also recognize the multiple device ratios that are appropriate for various instructional goals.

Leaders who recognize the instructional strides that can be made with digital tools support effective instructional practices by:

- Advocating for and modeling personalized learning opportunities and experiences for all learners.
- Incorporating District-approved apps into instructional practices (i.e., Google Drive, OneDrive, Schoology, etc.) to provide learners with real world connections and experiences.
- Developing an instructional technology plan with measurable goals that aligns with various District initiatives.
- Researching alternative ways to secure funding and other resources for greater instructional technology support and effective implementation.
- Staying abreast on digital tools that can be appropriately leveraged to provide relevant, personalized learning opportunities.

Leaders who support the use of digital tools in instruction recognize the college and career implications for all learners by:

- Understanding the importance of digital citizenship, where learners are aware of safe, acceptable, and responsible digital engagement.
- Mandating digital citizenship training for school staff.
- Incorporating digital citizenship curriculum across all subject areas.

Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

### **Change Management**

The outcome of embracing the following recommendations is personalized learning for all learners, which is fully realized in a 1:1 learning environment. However, reaching this full potential requires an instructional paradigm shift that is gradual in its implementation and supported by an infrastructure that is prepared to address it. In order for all levels of the District to embrace this shift, a change management model is needed to guide its implementation and buy-in from school leaders. For the purposes of this report, the ADKAR Model was selected due to its focus on how individuals within an organization are impacted by change, with the most impacted stakeholder being teachers.

The ADKAR Model addresses the following goals for change:

- Awareness of the need to change.
- Desire to participate and support the change.
- Knowledge of how to change.
- Ability to implement the change.
- Reinforcement to keep the change in place.

## Prosci<sup>®</sup> ADKAR<sup>®</sup> Model



If educators are not leveraging technology, how will students be best prepared for today's increasingly digital world?

Creating awareness at all levels of the District is founded on answering the following questions: Why do we need to change? What is the purpose? Why is this change needed at this time? The compelling reason guiding the need for an instructional paradigm shift is the District's goal to prepare students for a 21st century society. Without implementing digital learning tools in

Leaders who support the use of digital tools in instruction recognize the college and career implications for all learners. daily instruction, students will miss out on opportunities to practice realworld skills needed to thrive in a growing digital environment.

When awareness has been effectively developed, desire to pursue this change follows because school leaders recognize and understand the need to change. This is often the most challenging step in the change management model as it depends on personal choice of the individual to choose to participate or not. For this reason, effectively communicating compelling examples is necessary to inform all District stakeholders about the critical need to shift instructional practices to incorporate digital learning tools.

Upon cultivating a desire to change throughout the District, the next step is developing stakeholder knowledge in how to carry out the change. Professional learning opportunities for all stakeholders is imperative to educate leaders on how to incorporate digital learning tools and how to adapt instruction to the opportunities afforded by digital tools. For this reason, this report will highlight various schools, teachers, and neighboring Districts who model instructional practices enhanced by digital learning tools.

Change is not immediate; it will take time and be an ongoing process. Through increased professional learning opportunities and embracing a District-wide culture of exploring and experimenting, the District would support the ability for educators to apply what they have learned. More importantly, continuous professional learning opportunities would help the District determine the rate of adoption of personalized learning practices. Accepting that this change will require sustained effort and time to implement is critical to the success of an instructional paradigm shift.

Sustaining a change initiative requires consistent reinforcement, which must occur at all levels of District leadership. Thus, ensuring leaders understand and accept the following instructional recommendations is imperative. With leadership support alongside highlighting exemplary schools, the instructional paradigm shift required to support today's students can be seen as a possibility for all students, teachers, and principals.

# Foundation

The recommendations that follow were informed by a variety of research and resources with a special focus on the 2015 National Education Technology Plan (NETP) and the 2016 International Society for Technology in Education (ISTE) Standards for Students, which align with the ITI Task Force instructional recommendations.

## National Education Technology Plan

The 2015 NETP provides the vision for instructional technology nationwide, highlighting the potential of technology to amplify instructional practices and address matters of equity and accessibility.

Other notable themes throughout the 2015 NETP that heavily influenced the ITI Task Force instructional recommendations are as follows:

- Emphasis on leadership and its important role in creating and sustaining a culture that embraces change and innovation, which is why this report includes a section on leadership expectations.
- Developing a shared vision, which this report aims to provide by reflecting the thoughts of a task force comprised of instructional, information technology, and community representatives.
- Focus on student agency, which this report addresses through its advocacy of personalized learning practices District-wide.
- Underscoring the need for teacher preparation, which this report also emphasizes by recommending increasing professional learning opportunities.
- Cautionary approach to implementing Bring-Your-Own-Device (BYOD), which this report briefly addresses as it is still under a review as an alternative practice.

An important shift was made in the 2015 NETP from the 2010 NETP where the original question was, "should we use technology?" Instead, the 2015 NETP report operates from the perspective that using digital learning tools is no longer an option; it is imperative if we are to prepare students for today's world. The NETP provides the vision for instructional technology nationwide.

## **ISTE Standards for Students**

The 2016 ISTE Standards for Students were designed by educators across the nation representing a variety of curricular background and grade levels. In fact, the ITI Task Force was given an opportunity in January 2016 to review and provide in-depth feedback on the development of these standards during a virtual session led by Carolyn Sykora, ISTE Standards Director.

The ISTE Standards provide a framework for learning in-depth, digital age skills and attributes with learning that is amplified through technology. Each standard emphasizes pedagogy enhanced with technology to support all learners in engaging and thriving in a connected, digital world. The reward, however, will be educators who skillfully mentor and inspire students to amplify learning with technology and challenge them to be agents of their own learning.

The 2016 ISTE Standards students call for:

Empowered Learners: Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.

Students:

- a. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.
- b. Build networks and customize their learning environments in ways that support the learning process.
- c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
- d. Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.

Three levels of support are needed to carry out each instructional recommendation: personnel support, resource support, and parent support. Digital Citizens: Student recognize the rights, responsibilities and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.

#### Students:

- a. Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.
- Engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices.
- c. Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.
- d. Manage their personal data to maintain digital privacy and security and are aware of the data-collection technology used to track their navigation online.

Knowledge Constructors: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.

#### Students:

- a. Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
- b. Evaluate the accuracy, perspective, credibility and relevance of information, media, data, or other resources.
- c. Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
- d. Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

Innovative Designers: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.

Students:

a. Know and use a deliberate design process for generating ideas, testing

theories, creating innovative artifacts or solving authentic problems.

b. Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.





Professional learning opportunities must reflect and model the type of interactions and tasks that are needed to prepare students for today's digital world.

- c. Develop, test and refine prototypes as part of a cyclical design process.
- d. Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

Computational Thinkers: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

#### Students:

- a. Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.
- b. Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problemsolving and decision-making.
- c. Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.
- d. Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Creative Communicators: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

#### Students:

- a. Choose the appropriate platforms and tools for meeting the desired objective of their creation or communication.
- b. Create original works or responsibly repurpose or remix digital resources into new creations.
- c. Communication complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations.
- d. Public or present content that customizes the message and medium for their intended audiences.

Global Collaborators: Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

#### Students:

- a. Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
- b. Use collaborative technologies to work with others, including peers, experts, or community members to examine issues and problems from multiple viewpoints.
- c. Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
- d. Explore local and global issues and use collaborative technologies to work with others to investigate solutions.

These particular resources played a central role due to their broad applicability, forward-thinking perspectives, and up-to-date examples, which provide a clear and innovative direction for the District.



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## Recommendations

Six instructional recommendations were developed around three core principles: learner agency, academic rigor, and learner-centered learning environment. Learner agency is defined as learners being self-directed, engaging as both consumers and producers of knowledge. Academic rigor is defined as instructional experiences that encourage computational thinking, allow learners to struggle through and organize abstract information, and which provide real world connections where learners can actively apply their knowledge to circumstances beyond the classroom. Such a learner-centered learning environment is facilitated by a learning management system (LMS), where educators can design lessons that are collaborative and personalized to meet students where they are in their learning.

Recommendation 1: Enact a continuum for achieving learner agency for students and school leaders. In developing and adopting a continuum for achieving learner agency recognizes that learners will invariably be at different places in their learning compared to their peers. The primary purpose of the continuum is personal reflection, self assessment, and growth. Through change management, the development and adoption of such a continuum would demonstrate the shift in mindset, culture, practices and resources needed to achieve personalized learning.

## Recommendation 2: Support teachers in exploring curricular content that is interdisciplinary and provides authentic, real-world application. A

learner's educational experience is more authentic and has greater value when the curriculum reflects real life. Engaging learners and helping them to develop their knowledge, insights, problem-solving skills, selfconfidence, self-efficacy and a passion for learning are common goals that effective educators incorporate in the classroom. Infusing instruction with classroom practices that promote exploration and interdisciplinary activities, however, remains a challenge for many educators. Thus, supports are needed to facilitate the development and design of instructional experiences that foster authentic, realworld applications.

Recommendation 3: Support personalized learning initiatives District-wide.

When educators teach to an "imaginary average student" or with a "one size fits all approach," learners miss out on receiving personalized instruction that helps them develop learner agency. Research such as that referenced in





JUNE 2016

In order for LAUSD to continue and fund technology at schools the school District may want to pursue the options of either obtaining a bond measure or a parcel tax approved by voters. the Universal Design for Learning (UDL) Framework clearly indicates that a personalized learning approach identifies and monitors the learner's modalities and preferences to ensure their learning needs are being met. Providing access to appropriate digital tools and resources in addition to their purposeful use enable educators to create a learning environment that is both flexible and personalized for each learner.

Recommendation 4: Integrate a learning management system (LMS) in support of a learner-centered learning environment. Personalized learning cannot occur without leveraging the utility of an LMS, which brings forth opportunities that were previously not feasible in a traditional classroom. An LMS serves as a platform for housing class materials, assessments, and online communication and where students, teachers, and parents can sign on to access these materials anytime, anywhere.

Recommendation 5: Design and deliver learner-driven professional learning opportunities for school leaders, teachers, students, parents, board members and community and business leaders. Professional learning opportunities must reflect and model the type of interactions and tasks that are needed to prepare students for today's digital world. For many of today's educators, the type of instructional paradigm shift promoted in these recommendations will require a steep learning curve in understanding why it is important and how to implement it. Professional learning must focus on creating safe and productive spaces for teachers to begin planning and experimenting with the concepts that have been shared. Too often, professional development experiences center on giving strategies to teachers rather than coaching them on how to deliver the strategies to students. As a result, teachers leave the session with a toolbox of ideas that are rarely implemented. Instead, more personalized professional learning time should be spent on helping teachers plan, develop materials, and practice delivering the strategies with support. Through modeling such instructional practices in professional learning opportunities, it is one important method of building capacity District-wide.

Recommendation 6: Develop and adopt District-wide tools to measure lesson effectiveness. The District is in need of identifying lesson effectiveness tools to ensure that each educator's approach to academic rigor is providing consistent learning gains across the District. The following grade span examples demonstrate how classroom activities can be designed to address the aforementioned recommendations while helping students meet ISTE standards in elementary and secondary settings:

Grades: Elementary Age Level: 7-year-olds Content Area: Science, Language Arts, Geography Learning environment: Four laptops and four tablets per classroom Technology: Computers and tablets

In this scenario, 7-year-old students prepare team projects they will use to teach classmates about biomes and habitats.

Students often get their first introduction to biomes and habitats at age 7. Children are typically fascinated with science at this age, but the vocabulary and breadth of the content can be overwhelming. Rather than expect each child to conduct an in-depth study of every biome included in the unit, a pair of primary teachers decided to approach this science unit in a different way.

They began by providing a brief overview of biomes to the entire class. This included an explanation of what biomes are and an introduction to the seven biomes they would be studying. Then their approach took a new turn. Understanding that even children this young prefer activities where they are creating something as opposed to memorizing basic information, the teachers asked their young students to: work in trios to conduct online research about one of the seven biomes; select a project idea from a list of suggestions; design and create their chosen project; and use that project to teach the rest of the class about their assigned biome.

Primary students typically need more instructional support than older elementary and secondary students. This entails more teacher planning time, but the children's need for additional scaffolding does not preclude their abilities to take initiative, work collaboratively, think critically and demonstrate their learning through technology-supported learning activities. What does planning and implementation look like? Developing a sustainable infrastructure should be founded on three key principles: creating access, providing a variety of support, and developing appropriate processes and procedures. The 2015 NETP report operates from the perspective that using digital learning tools is no longer an option; it is imperative if we are to prepare students for today's world. First, students needed a workspace for accessing links to digital research materials easy enough for them to use. The teachers opted to use an online curation tool they'd used with students previously to create an interactive Biomes & Habitats lesson. Students in each classroom had access to four tablets and four laptops. These devices were used to create or document the final student projects. Teachers also created a class workspace so students could easily turn in digital assignments. Since students were already familiar with these tools, no time was required to teach basic technology skills.

The online lesson included four questions each student team answered related to its biome. The questions ranged from basic comprehension to analyzing information that was presented in the online lesson. Students took notes digitally or by using paper and pencil, making note of sources they'd used so they could cite these when they created their projects. Once they responded to the questions, student teams chose a project idea from a list provided at the end of the online activity. They were also permitted to pitch an original project idea to their teacher. Project suggestions included tasks like recording a podcast, writing an e-book and making diagrams or models. Technology tools were available, but not necessarily required.

As each team completed its project, one member turned in either the project itself or detailed photos of the project. On the final day of this unit, each team taught the rest of the class about the biome they studied, using their project as an instructional aid. Finally, student projects were posted online for ongoing reference.

What is the connection to the ISTE Standards for Students?

- Empowered Learner—The 7-year-olds are asked to either choose from a list of ideas for their projects or pitch an original idea to their teacher. This approach enables them to take responsibility for their learning and demonstrate that learning in a variety of ways.
- Digital Citizen—By noting and citing sources, students are learning to abide with copyright and fair use laws.
- Knowledge Constructor—With support from their teachers, these youngsters are learning to locate and evaluate information related to learning topics. The project requirement ensures students create one or more artifacts related to their learning.
- Creative Communicator—In the course of teaching peers about a biome, students are afforded opportunities to present knowledge based on information they have customized for a specific audience.

 Global Collaborator—As they complete their team projects, students are working collaboratively and contributing constructively to produce products they can share with classmates and learners from other backgrounds.

#### Grade: Secondary

Age Level: 14- to 18-year-olds Content Areas: Language arts, social studies, science Learning environment: Classroom, computer lab, library/media center Technology: Any device that can record video (digital camera, tablet, etc.), laptops

As part of their social studies and science coursework, high school students engage in long-term social action projects that address local and global issues. The culminating activity for these projects is a 3- to 5-minute video about each project.

Service learning that is grounded in either the social studies or science curriculum is a time-honored way for students to explore real-world issues and develop empathy and leadership skills by reaching out to help others. Over time, this idea has morphed from very short-term goals, such as a clubsponsored clothing drive, to projects that last one or two semesters. There are even programs where students are participating in multi-year social action projects. Students attending the high school featured here are transitioning from one to multi-year program commitments focused on local examples of global issues. The purpose of these activities is to encourage students to develop skills they need to become global citizen leaders. Broad project topics include: human rights, ethical issues, respect for law, the environment, the underprivileged, various disabilities, psychosocial issues, culture and heritage.

A critical piece of these projects is the underlying digital and communication skills students must acquire to be successful in implementing and sharing projects that have a global focus. Accurate research requires digital literacy. Communication with participants not readily available on campus necessitates online collaboration of one form or another. Project management must be facilitated through effective use of productivity tools. And the sharing of stories entails using various forms of social media to spread the word. For example, in the course of creating their 3- to 5-minute videos, in addition to learning how to point a camera to shoot video, students are learning how to develop ideas and organize their stories. They explore ways that scripting, acting and editing are used to communicate ideas and shape viewers' opinions. Practitioner schools will be supported in developing as a District-wide exemplar where digital tools and resources are effectively leveraged to support personalized learning. For students who want to participate, the high school hosts an annual film festival that spotlights the best of the videos submitted. Only those videos related to the social actions projects are accepted. The festival is a community effort with active participation from: faculty who advise students as they develop and implement their social action projects and assist with making the videos; parents who support their children during the process of creating their videos and then attend the festival event; and the students themselves who spend countless hours working on their entries. Past topics for videos have included: the Syrian refugee crisis; special needs that impact students including Autism and Down Syndrome; eating disorders; animal rights; nature preservation; and bullying.

What is the connection to the ISTE Standards for Students?

- Empowered Learner—Each student or team of students selects and pitches a topic for a social action project that will be the basis for a 3- to 5-minute video. Students are offered a great deal of autonomy in this learning process and also are encouraged to experience learning in formal and informal environments.
- Digital Citizen—The study of media literacy throughout this activity provides a platform for students to learn responsible use of language, acting and editing when presenting a case for something or making a point.
- Knowledge Constructor—Throughout this project, students explore realworld issues, pursuing answers or solutions. They are encouraged to plan and conduct effective research, and evaluate the resources they find, both print and digital. They use the information they gather to build connections and draw conclusions.
  - Creative Communicator—Throughout this activity, students are creating an original work with the purpose of clearly communicating complex ideas. The final video presents content about their social projects in a manner designed to get their point across to parents, educators and fellow students.
    - Global Collaborator—Learning skills that will enable students to function as global citizens is one of the foundations of this project. This is embodied in the collaborative nature of the projects and opportunities to examine issues from multiple points of view as students explore local and global issues.

Special consideration to Carolyn Sykora, ISTE Standards Director, and her team for their permission to include the above grade span examples.

## Infrastructure

In order to support each instructional recommendation, the following sections outline infrastructure needs in order to realize the task force's proposed instructional vision. The District's approach to developing a sustainable infrastructure should be founded on three key principles: creating access, providing a variety of support, and developing appropriate processes and procedures.

#### **Creating Access**

Need 1: Ensure students and educators have broadband access to the internet and adequate wireless connectivity at school. Ensuring schools have connectivity means learners have access to a global knowledge base, such as streaming videos for instructional purposes, participating in synchronous or asynchronous digital groups, and using cloud-based tools. Without reliable connectivity, however, learners will be unable to leverage digital tools and resources that enhance instruction. Moreover, the U.S. Department of Education has declared access to the internet as a civil right due to its critical role in today's society.

President Obama had set an internet access minimum of 100 megabits per second per 1,000 students with a target speed of 1 gigabit per second by 2018 (NETP, 2015). This translates to a per-student target of at least 1 Mbps to meet the the 2018 goal. L.A. Unified currently meets and exceeds this goal. The District has the following connectivity standards:

- All schools have scaleable fiber capacity to reach 2 gigabit per second.
- Usage is monitored on a daily basis. Any school that reaches 70% of its current bandwidth is incrementally increased to the next highest level.
- Wireless access is provided throughout all LAUSD K-12 campuses with a 6 Mbps per student allocation. This value assumes a minimum target per user bandwidth for all students using a device at the same time.

Every learner needs access to at least one device that connects to the internet. Need 2: Establish a baseline minimum that every learner has access to at least one device that connects to the internet. The U.S. Department of Education recommends that Districts across the nation strive towards providing 1:1 learning environments, which begins with an internetcapable device. Whether it should be a tablet, a desktop, or a laptop is dependent on the established instructional goals. For example, creative activities are often best served by nimble mobile devices such as small tablets while instructional activities requiring research and writing may be better served through laptops. Thus, the type of device selected should be based on its appropriate use according to the instructional goals and vision.

The District's current student to device ratio is now under 2:1. L.A. Unified currently has the following device access across the District:

- There are 101 Board-approved 1:1 school sites, which combined have a total of 82,430 devices that are internet-capable.
- 895 school sites within the District have access to a shared-use cart of devices, which totals 77,525 internet-capable devices.
- District-wide, there have been a total of 209,800 internet-capable devices purchased by schools.

As the District continues working towards providing access to schools, there are a number of external programs that offer internet-access support, especially at home. The following low cost internet options for families were identified as of Spring 2016:

- Sprint: Everyone On Program: Schools can purchase a modem for \$100.00 and families are available to receive free internet service for 4 years. In order to apply for this program, a school must provide a copy of their instructional technology plan.
- AT&T: Through this option, families who qualify for the Supplemental Nutrition Assistance Program (SNAP) can apply for internet service that cost between \$5 to \$10 per month. Families would need to verify that they receive government assistance with their application.
- Charter: This low cost option is available for families whose students participate in the free and reduced lunch meal program. This option provides unlimited data access for \$14.99 per month.
- Frontier: This option costs \$14.99 per month, and families who sign up for internet service who will be experiencing internet access at home for the first time will receive a free Chromebook.

Engaging learners and helping them to develop their knowledge, insights, problem-solving skills, self-confidence, self-efficacy and a passion for learning are common goals that effective educators incorporate in the classroom. Ultimately, to achieve personalized learning for all learners, having access to a device that connects to the internet is paramount in order to take advantage of the countless resources and content available on the web.

### Need 3: Ensure interoperability between a District-wide Learning

Management System (LMS) and the District systems. To support the instructional recommendation in adopting a learning management system, it is imperative that the District ensure it works seamlessly with current District systems, such as MiSiS. Interoperability is critical so as to not disrupt instructional practices and other processes needed to support student success. L.A. Unified is currently conducting a pilot program to determine the interoperability between Schoology and the District's student information system (MiSiS). Thus far, a pilot has been completed that demonstrates successful integration of Schoology and MiSiS.

In using an LMS, the need for acquiring and implementing digital content will be critical. L.A. Unified is pursuing the use of digital content in blended and virtual learning opportunities. By using online content, LAUSD will be able to increase the number of A-G credit bearing courses across secondary schools in the District. Such access to digital content allows for:

- Additional options for students requiring credit recovery opportunities to improve graduation rates.
- Increased access to courses and content that otherwise may not have been available.

To support the ongoing adoption and implementation of digital content, the District has issued a "Unified Digital Instructional Procurement Plan" (UDIPP) to prospective providers of digital content including online course providers and textbook publishers. There are five (5) main requirement areas in this plan that vendors must address:

- Educational Value: Vendors must demonstrate that their digital content products meet educational standards, provide opportunities for differentiation, provide parental resource support, and include professional development supports.
- Single Sign-On (SSO) and Security Assertion Mark-Up Language (SAML): The District requires vendors support the use of LAUSD-provided Single Sign-On credentials for students and teachers to access instructional materials, preferably via Security Assertion Mark-up Language (SAML)
   2.0. SAML is an XML- based, open-standard data format for exchanging authentication and authorization data between parties.

Ensuring schools have connectivity means learners have access to a global knowledge base.

- Student Data Privacy: The District requires that vendors provide a detailed explanation of how student data is kept private and secured.
- Data Security: The District requires all proposers to also align their product(s) to all federal, state and District rules and policies regarding security of data transferred for the purposes of authorization.
- Learning Management System Compatibility: The District requires vendors to enable the integration of curricula and data using the District LMS by providing content that adheres to standards published by the Instructional Management System (IMS) Global Learning Consortium. In addition to adhering to interoperability standards, publishers must provide all course content, including but not limited to textbook materials, assessments, activities, lesson plans, etc., in a manner that will allow the allow the District, or a District-contracted provider, to upload materials directly into the LMS.

This plan ensures that companies offering various digital instructional software, licenses, or online subscriptions meet the District requirements.

#### **Providing Support**

Two levels of support are needed to carry out each instructional recommendation: resource support and personnel support.

#### **Resource Support**

Need 4: Ensure District leaders understand and adopt a change management approach to leveraging digital tools and resources for instruction. Utilizing the full potential of digital tools and resources requires an instructional paradigm shift that is gradual in its implementation and supported by an infrastructure that is prepared to address it. In order for all levels of the District to embrace this shift, a change management model is needed to guide its implementation across the District. The ADKAR Model addresses the following goals for change:

- Awareness of the need to change.
- Desire to participate and support the change.
- Knowledge of how to change.
- Ability to implement the change.
- Reinforcement to keep the change in place.

The Education Technology Grant Program was successful in seeding innovation District-wide.

#### **Personnel Support**

Need 5: Repurpose staffing according to the instructional goals and vision to achieve personalized learning. Using digital tools and resources for instruction is no longer an option. With the plethora of hardware and software to monitor, it is important that each school identify a staff member to fulfill two critical roles: 1) an Instructional Device Manager and 2) a Mobile Device Manager.

An Instructional Device Manager (IDM) is responsible for managing learning device inventory for a school site. Thus, devices under the purview of the IDM are limited only to devices used for instructional purposes.

The safety and security of the District's network and, more importantly, its users is a priority. In order to achieve this goal, a Mobile Device Management (MDM) system is required to provide positive identification of all devices on the District's network to monitor applications, software, and system updates across all devices. L.A. Unified has taken the following steps to provide support:

- ITD currently administers the District's MDM system.
- The District is currently licensed for the use of MDM on 181,000 devices.
- A Request for Proposal for a District-wide MDM system to manage District and personal devices is in development.

#### **Develop Processes & Procedures**

Need 6: Implement a process for annual review and update of related policies that support the instructional vision of personalized learning. In order to support a learning environment that takes full advantage of digital tools and resources, the District needs policies that are up-to-date reflecting the dynamic nature of using technology for instruction.

The following policies have been identified as critical and in need of consistent review:

- Responsible Use Policy
- Social Media Policy for Employees
- Social Media Policy for Students
- Data privacy and security policies
- Purchasing policies

Using digital tools and resources for instruction is no longer an option.

### Need 7: Establish pathways for collaborative partnerships between the Division of Instruction and key departments within the District. Pursuing an

instructional practice leveraging digital tools and resources is a collaborative effort, especially in a District the size of L.A. Unified. For this reason, it is imperative that the Division of Instruction partner with various departments to provide a unified message and ensure the instructional vision is threaded throughout District efforts. Key department partnerships include:

- Parent Community Service Branch
- Information Technology Division
- Facilities Services Division
- L.A. School Police



# **Funding Options**

If the District wanted to become a 1:1 environment with tablets and laptops, it would cost an estimated \$311 million as of June 2016 for these types of devices in addition to personnel support according to current ITD inventory data. However, due to limited funds to make a 1:1 environment a reality at this time, the ITI Task Force discussed alternative funding options considered or undertaken by other Districts across the nation.

In order to provide access to digital learning devices District-wide and realize the vision of the ITI Task Force recommendations, the following funding models were discussed:

- Bond Funds
- Textbook Funds
- External Partnerships
- Leasing Devices
- Bring-Your-Own-Device (BYOD)

#### **Bond Funds**

Pursuing another existing bond measure or a parcel tax approved for future purchasing is one option to support the instructional paradigm shift outlined in this report. In order to ensure that these monies are making a significant impact, the task force recommends using the Education Technology Grant model, which is a matching funds opportunity. This model was founded on a matching grant design, providing monies for schools who demonstrated a commitment to personalized learning to purchase hardware with bond dollars. The Ed Tech Grant opportunity was available for all schools to apply to which 343 schools submitted an application. In total, 242 schools were awarded a grant, where schools were required to provide matching school funds. Thus, the Ed Tech Grant effort resulted in schools providing a combined total of \$3,704,508 in non-bond matching funds. The use of monies in this model has demonstrated that schools are interested in technology with the appropriate support.

#### **Textbook Funds**

Purchasing digital content allows access to additional open educational resources. The District currently is adopting ELA/ELD digital content, and previously has purchased math digital content for elementary grade levels. Other school Districts such as San Diego Unified and Riverside Unified have decided to spend textbook budget funds to invest in digital content.

Using digital tools and resources for instruction is no longer an option.

#### **External Partnerships**

Partnering with large companies or local business to support the purchase of learning devices has been a strategy employed at a variety of Districts across the nation. The Division of Instruction will be opening an Innovation Department in Summer 2016 to support and facilitate external partnership efforts.

#### **Leasing Devices**

In an effort to maintain schools with the latest technology capabilities, the task force recommends L.A. Unified consider saving money by discussing with vendors the opportunity of leasing equipment.

#### BYOD

BYOD remained a critical topic throughout task force workgroup meetings. However, the NETP cautions the implementation of a BYOD program due to several misconceptions. While it would lessen the cost of purchasing devices for the District, it would put a greater onus on families to provide technology needed for instruction. Thus, the District has convened a subcommittee to take a closer look at BYOD to determine its impact on stakeholders and its utility as a cost-saving alternative.



The District's approach to developing a sustainable infrastructure should be founded on three key principles: creating access, providing a variety of support, and developing appropriate processes and procedures.

# **District Efforts**

In adopting a District-wide culture of innovation and change, this allows for bold shifts in systems and practices. To support the instructional paradigm shift outlined in the recommendations above, L.A. Unified has taken necessary steps to begin the shift towards personalized learning and effective integration of digital learning tools.

#### **Current Efforts**

The District has taken a number of steps to support the instructional vision of personalized learning District-wide. Current efforts have included:

- Education Technology Grant Program
- Shared-Use Device Protocols
- Online Gradebook Pilot/Learning Management System
- School Instructional Technology Plan
- Summer Professional Development Institute
- Online Course Offerings
- Ongoing 1:1 School Support
- Digital Citizenship Curriculum Development

Three efforts are discussed below in detail which highlight ways access to digital learning are increasing across the District: 1) Education Technology Grant Program; 2) Shared-Use and Surplus Devices; and 3) Reimagined Models of Support.

#### Education Technology Grant Program

The District's most recent instructional technology effort has been the Education Technology Grant Program, which was successful in seeding innovation District-wide. In September 2015, the Superintendent proposed to the Board that the bond portion of settlement funds be invested in a matching grant program that would expand schools' access to instructional technology where there was a need and innovative ideas existed for how to use it. Additionally, the grant program was envisioned to promote collaboration among District schools. The Educational Technology Grant program was developed through a collaborative effort that included leadership from each Local District, the Division of Instruction, the Information Technology Division and the Superintendent's office. The recommendations are founded upon creating a learning environment where learner agency and academic rigor are possible. A grant application template, scoring rubric, and completion guidelines were communicated to schools in November 2015 and a deadline of January 8, 2016 was set for application submittals. Three-hundred forty three schools submitted applications prior to the deadline and staff from the Division of Instruction and Local District offices scored the applications using the rubric that had been distributed. In accordance with the guidelines established at the beginning of the program, Local District (LD) offices made the final determination of grant award winners and amounts based on LD staff's knowledge of school need and their readiness as well as the rubric score each application received.

In order to qualify for the grant, each school was required to commit matching funds. Schools that proposed a partnership with another school or an outside organization as part of their plan were required to provide matching funds equal to half of their grant award. Schools that did not propose a partnership were required to provide matching funds equal to their entire grant award. All grant funds are to be spent on capital equipment that qualifies for bond funding. The other components of a school's solution that are not capital in nature will be funded with non-bond funds from the school's matching contribution.

#### Shared-Use and Surplus Devices

In August 2015, the District encouraged principals to use testing cart devices for instruction, but they remained largely unused. Thus, devices previously used for testing were redesignated as Shared-Use Devices, meaning that devices were cleared for teachers to use as instructional tools in addition to testing devices. All schools have access to a shared-use cart, which include 35 devices per cart. As aforementioned, 895 school sites within the District have access to a shared-use cart of devices, which totals 77,525 internetcapable devices. Essentially, all schools have the opportunity to provide personalized learning by creatively using the shared-use cart.

In creating greater access to devices, on March 8, 2016, the Board of Education voted in favor of Board Report #296-15/16 which approved the distribution of approximately 7,500 surplus devices to middle schools, primary centers, and to Board-approved 1:1 schools with Expanded Transitional Kindergarten (ETK) and Transitional Kindergarten (TK) students. Surplus devices provided served in the same capacity as shared-use devices for middle schools and primary centers.

The reimagined model of support will help produce teacher and school-wide exemplars to reinforce the shift in instructional practices.

#### **Reimagining Models of Support**

As evidence from prior initiatives and as identified in the research, instructional technology practices are best addressed when an effective implementation plan is in place. The reimagined model of support outlines a proposed plan in reimagining support structures and resources to develop effective digital learning practices District-wide.

The reimagined model of support reflects a more sustainable approach given limited resources that also helps produce teacher and school-wide exemplars to help reinforce the shift in instructional practices. Exemplar schools and teachers will be leveraged to support new schools as they develop awareness and a desire to pursue the necessary paradigm shift to support students.

The reimagined model of support is currently scheduled to be implemented starting the 2016-2017 academic school year. The specifics of the reimagined model of support are as follows:

- An application process will be initiated where schools or individual teachers can apply for personalized support focused on digital learning.
- Schools will be selected and designated as Practitioner Schools, which means they have demonstrated a strong commitment to personalized learning practices using digital learning tools.
- Teachers will be selected and designated as Teacher Leaders, which means they applied individually and demonstrated a strong commitment to personalized learning practices using digital learning tools.

Practitioner schools will be supported in developing as a District-wide exemplar where digital tools and resources are effectively leveraged to support personalized learning. Practitioner Schools will also have a dedicated Instructional Technology Facilitator (ITF) staff member who will serve on the school's instructional leadership team and support their digital learning initiatives. Practitioner Schools will also receive training on LMS use and implementation as well as personalized professional learning opportunities tailored to the school's needs.

Teacher Leaders will be supported through small network models and paired with an ITF. The purpose of Teacher Leaders is to help build capacity and impact a larger number of schools where Teacher Leaders ultimately help train others at their respective school sites. Teacher Leaders receive ongoing lesson design support and will attend a professional learning opportunities designed by the Instructional Technology Initiative staff. Sustaining a change initiative requires consistent reinforcement, which must occur at all levels of District leadership. In order for all levels of the District to embrace this shift, a change management model is needed to guide its implementation among school leaders. Together, Practitioner Schools and Teacher Leaders will help realize the instructional recommendations put forth as the District moves towards personalized learning and embraces the need to prepare students, teachers, and school leaders for an increasingly digital environment.



# Conclusion

In recognizing the dynamic nature of digital learning, the ITI Task Force recommendations will live on a platform called Scalar, which is a media-rich publishing platform aimed at creating an interactive reading experiences. With Scalar, each recommendation will be annotated with videos, pictures, and research to help readers develop a comprehensive understanding of what it will take to enact personalized learning District-wide. The digital counterpart to this report will be available at the following link: <a href="https://www.tinyurl.com/ititaskforce">www.tinyurl.com/ititaskforce</a>

If educators are not leveraging technology, how will students be best prepared for today's increasingly digital world? How can students be expected to excel in higher education environments or effectively launch their careers without exposure to digital tools? More importantly, how can teachers effectively meet each student precisely where they are without digital tools to help them identify areas of instructional need? Personalized learning cannot occur in the District's current instructional model unless educators begin leveraging the many opportunities afforded by digital tools and resources to promote learner agency and academic rigor as identified in the ITI Task Force recommendations. Through collaborative and innovative practices, the District can continue preparing all students to lead and succeed in a 21st century world.



Using digital learning tools is no longer an option; it is imperative if we are to prepare students for today's world.

# Glossary

The following terms are critical to the understanding and implementation of each recommendation.

21st century instruction: Ensure that students have real-world opportunities to synthesize, apply and demonstrate their mastery of key concepts and 21st century skills. These are the skills students need to succeed in work, school and life. They include:

- Core subjects (as defined by ESSA)
- 21st century content: global awareness, financial, economic, business and entrepreneurial literacy, civic literacy and health and wellness awareness
- Learning and thinking skills: critical thinking and problem solving skills, communications skills, creativity and innovation skills, collaboration skills, contextual learning skills and information and media literacy skills
- Information and communications technology literacy
- Life skills: leadership, ethics, accountability, adaptability, personal productivity, personal responsibility, people skills, self-direction and social responsibility

Academic Rigor: Instruction that promotes learners to think critically, creatively, and more flexibly.

Asynchronous: Learning that does not occur in the same place or at the same time. The term is most commonly applied to various forms of digital and online learning in which students learn from instruction—such as prerecorded video lessons or game-based learning tasks that students complete on their own—that is not being delivered in person or in real time.

Competency-Based Progression: Transitioning away from seat time, in favor of a structure that creates flexibility, allows students to progress as they demonstrate mastery of academic content, regardless of time, place, or pace of learning. Competency-based strategies provide flexibility in the way that credit can be earned or awarded, and provide students with personalized learning opportunities. These strategies include online and blended learning, dual enrollment and early college high schools, project-based and community-based learning, and credit recovery, among others. This type of learning leads to better student engagement because the content is relevant to each student and tailored to their unique needs. It also leads to better student outcomes because the pace of learning is customized to each student.

Computational Thinking: CT is a problem-solving process that includes (but is not limited to) the following characteristics:

- Formulating problems in a way that enables us to use a computer and other tools to help solve them
- Logically organizing and analyzing data
- Representing data through abstractions such as models and simulations
- Automating solutions through algorithmic thinking (a series of ordered steps)

- Identifying, analyzing, and implementing possible solutions with the goal of achieving the most efficient and effective combination of steps and resources
- Generalizing and transferring this problem-solving process to a wide variety of problems

Device Agnostic: Resource or devices will work/be compatible with various systems without requiring any special adaptations.

Differentiation: Instruction is tailored to the learning preferences of different learners.

Digital Badges: Digital badges are an assessment and credentialing mechanism that is housed and managed online. Badges are designed to make visible and validate learning in both formal and informal settings, and hold the potential to help transform where and how learning is valued.

Digital Citizenship: Digital citizenship can be defined as the norms of appropriate, responsible behavior with regard to technology use.

Digital Learning: any instructional practice that effectively uses technology to strengthen a student's learning experience. Digital learning encompasses a wide spectrum of tools and practices.

Growth Mindset: Understanding that learner talents and abilities can be developed through effort, good teaching and persistence.

Individualization: Instruction is paced to the learning needs of different learners.

Learner: Defined as students, teachers, administrators. Learners drive their learning from anywhere at anytime.

Learner Agency: Requires learners to take initiative and reflect on their progress to engage strategically in their own learning without waiting to be directed.

Learner-Centered Instruction: Pedagogy that is rigorous and based on college- and career-ready expectations; personalized; collaborative, relevant, and applied; and flexible, with learning taking place anytime, anywhere.

Learner Space or Learner-Centered Community: Learning spaces that are stimulating, engaging and supportive, provides opportunities for choosing and pursuing personalize learning goals.

Learning Management System (LMS): A learning management system (LMS) is a software application or Web-based technology used to plan, implement, and assess a specific learning process. Typically, a learning management system provides an instructor with a way to create and deliver content, monitor student participation, and assess student performance. A learning management system may also provide students with the ability to use interactive features such as threaded discussions, video conferencing, and discussion forums. Mastery-based Learning: Mastery Learning maintains that students must achieve a level of mastery (i.e. 90% on a knowledge test) in prerequisite knowledge before moving forward to learn subsequent information. If a student does not achieve mastery on the test, they are given additional support in learning and reviewing the information, then tested again. This cycle will continue until the learner accomplishes mastery, and may move on to the next stage. Mastery learning methods suggest that the focus of instruction should be the time required for different students to learn the same material and achieve the same level of mastery. This is very much in contrast with classic models of teaching, which focus more on differences in students' ability and where all students are given approximately the same amount of time to learn and the same set of instructions.

Personalized Learning: Instruction is intentionally designed, where the teacher takes on the facilitator role and the student demonstrates learner agency as an empowered learner.

Project-Based Learning: Defined as a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an engaging and complex question, problem, or challenge.

Real-world Connections: Instruction activities that draw from, or upon, actual objects, events, experiences and situations to effectively address a concept, problem or issue. It involves learning allows students to actually experience or practice concepts and skills, as opposed to learning that is theoretical or idealistic. It features learning projects that directly relate to, are relevant to, or provide benefit to students, their families or the community.

Synchronous: Learning that occur at the same time, but not in the same place.

Ubiquitous Connectivity: Ubiquitous computing is a paradigm in which the processing of information is linked with each activity or object as encountered. It involves connecting electronic devices, including embedding microprocessors to communicate information. Devices that use ubiquitous computing have constant availability and are completely connected. Ubiquitous computing focuses on learning by removing the complexity of computing and increases efficiency while using computing for different daily activities. Ubiquitous computing is also known as pervasive computing, everywhere and ambient intelligence.

Universal Design for Learning (UDL): A set of principles for curriculum development that give all individuals equal opportunities to learn. UDL provides a blueprint for creating instructional goals, methods, materials, and assessments that work for everyone--not a single, one-size-fits-all solution but rather flexible approaches that can be customized and adjusted for individual needs.