



# MEET THE PROMISE OF CONTENT STANDARDS:

TAPPING  
TECHNOLOGY  
TO ENHANCE  
PROFESSIONAL  
LEARNING



Learning Forward  
504 S. Locust St.  
Oxford, OH 45056  
513-523-6029  
800-727-7288  
Fax: 513-523-0638  
E-mail: [office@learningforward.org](mailto:office@learningforward.org)  
[www.learningforward.org](http://www.learningforward.org)

Author: Joellen Killion  
Editor: Tracy Crow  
Designer: Brian Deep  
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Learning Forward's *Transforming Professional Learning to Prepare College- and Career-Ready Students: Implementing the Common Core* is a multidimensional initiative focused on developing a comprehensive system of professional learning that spans the distance from the statehouse to the classroom. The project will reform policy and practice and apply innovative technology solutions to support and enhance professional learning. With an immediate focus on implementing Common Core State Standards and new assessments, the initiative provides resources and tools to assist states, districts, and schools in providing effective professional learning for current and future education reforms.

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**G**aston School District's budget for professional learning has been slashed to the bare minimum just as the district was beginning its second year of transition to the new state curriculum based on the Common Core standards in English language arts and mathematics. More budget cuts scheduled for the next year mean there will be no funds whatsoever for professional learning. Teachers, principals, and district staff are acutely aware that the decrease in resources for professional learning comes at a time when there is an increased demand for professional learning to support implementation of the new curriculum and the instructional changes it requires. Everyone realizes this lack of resources for professional learning could easily derail efforts already underway and increase resistance to the new practices.

Together central office curriculum staff, principals, and representatives of teachers gathered to study the problem and generate options for the superintendent and school board to consider. Discussions among the team members were heated, yet together they did a thorough analysis of all resources currently available for professional learning including staff, time, materials, technology, and funding.

District curriculum leaders reminded the team that the new standards required expertise in instructional practices that were not common in most classrooms; access for teachers, principals, and central office staff to sustained support for multiple years to make the instructional shifts; and instructional resources not currently available in the district. In essence, there was insufficient time and expertise to develop these resources internally. The limited professional learning funding made it impossible to bring experts into the district to work with the staff. After further deliberation, the team recommended that the primary needs for professional learning were more time for collaborative professional learning and access to reliable and valid instructional resources to support teaching and learning practices aligned with the new curriculum.

The superintendent agreed with the recommendations and worked with school principals to help them develop school-day schedules to provide regular and frequent collaboration time for teachers. He asked the central office staff to support the development of productive collaborative professional learning teams that focused on instruction for the new curriculum. Next he went to the local education foundation to seek its financial sup-

port to provide technology-based support for the curriculum and instructional resources required so every teacher, principal, and staff had what they needed at their fingertips. The foundation agreed to provide funding and required an evaluation of the resource use and impact each year for the next three years.

The superintendent's work was just beginning. He formed a team of stakeholders to study effective professional learning, the uses of technology to support professional learning, and the needs of students and educators to achieve the new standards. The charge to the team was to bring a provider recommendation and implementation plan to him in the next 120 days. He engaged the team in studying the definition of and standards for professional learning embedded in the state's school and district improvement policies and the district's comprehensive professional learning plan and Common Core implementation plans to establish criteria for reviewing possible providers. The team studied student achievement data, held focus groups with educators to identify and prioritize their needs, surveyed the district's technology infrastructure, and developed and vetted criteria with their constituents. Providers received invitations to submit proposals with evidence of how their products and services met the established criteria. After an initial screening, a limited number of providers made presentations to the selection and review committee.

While the district team was at work, the superintendent reached out to neighboring districts and the state department of education about the district's efforts to select a technology provider. He proposed to interested superintendents that they consider collaborating in the acquisition and implementation process once his team finalized its recommendation. Two small, rural neighboring districts asked to send one or two representatives to participate in the review process.

Parallel to the selection team's interaction with potential providers, a team of teachers working together with district curriculum specialists formed subject-specific review teams to identify, analyze, align, and share freely available resources that aligned with the state and district curriculum. The team received a stipend for this leadership role that included discovering potential resources; piloting or analyzing them for accuracy, effectiveness, and appropriateness and working with the curriculum specialist to align them to the district's curriculum framework. They served for two years at a time on this team with the potential for reappointment since new resources are always becoming available. Their role was to determine how the resources align with and support instruction for the district's curriculum framework. They also recommended resources for inclusion in the state's instructional support database.

While interacting with potential providers, the team began to identify the core components of its implementation plan. Educators would need training on how to access and use the learning resources. Coaches and principals would need to know how to integrate the learning resources into their individual and team interactions with colleagues. Central office staff and principals would need to know how to monitor use to increase the effectiveness of the learning resources. The superintendent would need a monitoring and evaluation process to receive quarterly reports on access and usefulness as well as on the effectiveness of the learning resources and to offer the school board and foundation annual evaluation data on the impact of the professional learning resources on educator practice and student achievement. The team created benchmarks for monitoring progress, identified how to develop capacity to use the professional learning resources, and formed a committee of representatives of all stakeholders to serve as the steering committee for implementation of the learning resources.

After intensive work over 120 days, the team presented its recommended provider to the superintendent and foundation board along with the implementation plan. The superintendent accepted the recommendation and immediately reached out to other school districts and the state department of education as partners in the acquisition of the professional learning resources to support teachers with implementation of new standards. Four school districts formed a purchasing partnership to negotiate with the provider for access and implementation support for the next three years with annual contract renewal options.

Central office staff, principals, and coaches from all four districts participated in a two-day intensive training provided by the provider on how to use the technology-based resources. When the materials were rolled out to teachers at the beginning of the school year, teachers were overwhelmed by the resources and didn't know how to make the best use of them. Coaches and principals worked closely with small groups of teachers on specific instructional units to help them learn how to identify the resources and use them in their planning and create instructional tasks for students. One step at a time, teachers began to make greater use of the full functionality of the system to archive instructional units, seek feedback from peers, post exemplary student work, and retrieve sample units, assessments, and student work to use in their team meetings. The district technology support staff worked hard to keep the district's network working smoothly and to maintain hardware in all schools for easy access. Special funding from the state allowed the purchase of more computers for classroom use and a special initiative with the state teacher association to support the purchase of personal laptops for teachers' professional use helped increase online access.

The breadth of the need for professional learning required for implementation of new standards overwhelms most districts and states. Nearly all reports on what teachers, district leaders, and state leaders want for successful implementation include professional learning among the most frequently identified needs.

Access to and engagement in effective professional learning for all educators are essential for full implementation of college- and career-ready standards. Classroom implementation of the new standards depends on teachers having intellectually stimulating opportunities to deepen content knowledge, expand instructional repertoires to increase rigor and engagement in learning, and employ rich pedagogical content knowledge. Teacher success also depends on the expanded capacity of their school and district leaders to shape a vision of academic success for all students, creating a climate hospitable to productive learning; cultivate leadership in others; support improving instruction; and manage people, data, and processes for continuous school improvement (Benson et al., 2012, p. 4).

In short, the success of education reforms in nearly every school system and state that include more rigorous expectations for student learning, new assessments to ensure student learning, and educator effectiveness systems to enhance the human capital systems depend on every educator having the knowledge, skills, dispositions, and practices necessary for success.

As the call for professional learning that incorporates ongoing feedback and support increases and resources to address that need decline, more states, districts, schools, and individuals are turning to technology. Technology creates significant opportunities for more focused professional learning, especially when it is effectively integrated into a comprehensive system for professional learning; provides easy access to content that is relevant to individual, team, school, district, and state goals; and includes high-quality content, application of learning within the work setting, and constructive feedback and support over time to refine implementation of learning. It is evident that not all technology-enhanced professional learning meet these criteria. This



brief outlines how technology can enhance professional learning, offers examples of how technology is being used to meet the demand generated by Common Core standards, provides guidelines for selecting and using technology as a resource for professional learning, and identifies common challenges technology presents in professional learning and ways to avoid them.

No doubt exists that technology can enhance professional learning, yet how it is used will determine the degree to which it has the potential to influence educator practice and results for students. As individuals, schools, districts, and states strive to meet the demand for professional learning generated by Common Core standards and other emerging initiatives in education, it is crucial to consider thoughtfully and plan accordingly for effective use of technology to enhance professional learning.



# TECHNOLOGY ENHANCES PROFESSIONAL LEARNING

**A**dvances in technology continue to expand opportunities and benefits for those seeking professional learning. Few will argue that these advances facilitate increased opportunities in professional learning for all educators. To realize the benefits that technology provides, those responsible for leading, planning, and implementing professional learning effectively weave technology into a comprehensive system for professional learning. **Technology is a purposeful component of a comprehensive system that includes a vision, goals, definition, standards, policies, and practices for coherent and continuous learning through educators' careers to support achievement of individual, team, school, district, state, and national education improvement goals.** Technology is a vehicle for enhancing personalization, collaboration with peers and experts, follow-through support for implementing new strategies and standards, efficiency, and access in professional learning.

**Personalization.** Technology supports professional learning that is personalized to meet each educator's unique learning goals and preferences by allowing educators to select and adapt what they learn, how they learn, and when they learn. Technology allows rapid responses to



performance data tied to a specific teacher and classroom. This data informs what immediate professional development needs can improve student learning. Technology permits individual educators to seek precisely the information they want from the sources they want it and at a time convenient to their personal and professional schedules. For many learners who are frustrated with one-size-fits-all professional learning that offers little differentiation, technology allows both professional learning providers and participants to design what works best for learners. When designed well, technology-enhanced learning permits learners to create their own learning pathways, examine content that is most appropriate to their unique learning needs, adjust depth and breadth of content to their particular level of need, and adjust practice guidance to align with their specific role responsibilities.

**Collaboration.** According to many learning theorists, learning occurs when learners connect with ideas and other learners. For decades learning theorists and researchers have promoted the value of interaction as a part of the learning process. Early uses of technology to enhance professional learning relied on static content and information transfer as the primary learning modes. The explosion of web-based tools promotes and supports social interaction, constructivism, and connectivism as primary learning theories (see Top 100 Tools for Learning 2012 <http://c4lpt.co.uk/top-100-tools-2012/>). Essentially these theories acknowledge that interacting or networking with others and ideas to create, clarify, and communicate understanding solidifies learning and promotes use of learning to enhance practice. Technology promotes collaboration among individuals who have common interests and needs through multiple forms of dynamic interaction. Through this process, learners can co-construct knowledge, share experiences, reflect on practice, seek feedback, and contribute to the learning of others.

**Access.** Increasingly people expect to be able to learn wherever and whenever they want and technology makes this possible (Johnson, Adams, & Cummins, 2012). The degree to which educators have the opportunity to engage in high-quality professional learning influences the effects of professional learning. Access to such learning is fundamen-

tally an equity issue. When some have access to effective professional learning and others do not, opportunity for growth and development may be limited, and that in turn may affect educators' effectiveness and efficacy. Resources for some learning have been limited, including time and funding for participation in face-to-face professional learning such as courses, conferences, or workshops that often require registration fees and travel. At the same time, access to online and hybrid learning has reduced some of the costs while maintaining and even increasing access to professional learning. Technology has increased opportunities for learning for educators in remote areas where travel is challenging because of distance and weather conditions, and even for educators for whom driving across town to the district office is too time consuming.

**Efficiency.** Large-scale change, such as implementation of college- and career-ready standards, redesigned student assessments, and educator effectiveness systems, places tremendous pressure on educators to redesign their routines and processes. Technology can alleviate some pressure educators feel when facing significant changes and help to facilitate them. For example, teachers report that they are stretched to their limit with locating resources and planning and executing lessons to align with new college- and career-ready standards. For teachers, these changes mean designing new lesson plans, searching for appropriate instructional resources, and developing new classroom assessments. For principals it means providing new professional learning, acquiring new strategies for giving feedback to teachers, and supporting them as they implement change in their classrooms. Technology can increase the efficiency of routine tasks, bring resources to the workplace, and provide ongoing feedback to refine and improve practice.

**Learning designs.** The design of the learning process influences the outcomes of the learning, particularly when the design incorporates the core elements of effective learning processes such as practice, feedback, and sustained support. Just as teachers are creating more challenge-based and active learning for their students, educator professional learning should create similar deeper learning for educators inside

and outside school, connecting educators with a global community, and promoting successful implementation of new initiatives designed to increase student success. Because the Common Core standards call for deeper learning, more engaged learning, and more ownership of learning for students, educators need the skills and expertise to support creating learning environments and experiences that engage students in applying 21st century skills in novel, authentic, and globally oriented situations.

Technology-based learning, if designed well, supports added practice, feedback, and support to deepen learning. In addition to assisting educators to use technology to facilitate routine work, their professional learning must model and engage educators in similar learning experiences using the technologies students are using, if appropriate. These technologies include mobile devices, tablet computing, game-based learning, personal learning environments, augmented reality, and natural user interfaces (Johnson, Adams, & Cummins, 2012). These advances in technology are causing learning designs to explode both for students and educators. Where early versions of learning via technology relied heavily on knowledge transfer via online text, newer advances are opening the door to augmented reality and natural user interfaces allowing educators to be fully engaged in simulated environments to practice and refine skills, problem solving, and contextual decision making. Gamification uses “game-based mechanics, aesthetics, and game thinking to engage people, motivate action, promote learning, and solve problems” (Kapp, 2012). The use of game-based designs for learning challenges both learning developers and learners to interact with content in highly engaging ways that expands the value of learning. MOOCs, massive open online courses, are changing the way learners participate in learning and how learning experiences are shaped (see [www.youtube.com/watch?v=eW3gMGqcZQc](http://www.youtube.com/watch?v=eW3gMGqcZQc)). Designs such as MOOCs reflect the belief that learning is not a linear process, information no longer limited, and the source of information reaches far beyond the teacher.

# SYSTEMS WITHIN SYSTEMS

History suggests that implementation of new initiatives requires major overhaul of education's approach to change. "All too often, implementation of major change efforts in education becomes a hodge-podge of standards over here, assessments over there, and teacher appraisal and incentives in still another box," suggest Tracy Benson et al. (2012). Districts, states, even whole countries, often have great front-end fanfare but without systemic leadership capacities a chronic inability to put the pieces together in implementation" (p. 5). A systems approach ensures coherence, coordination, and consistency for optimal results.

Professional learning is one component of a broad, holistic education system designed for student success. Included in this broad system are multiple, interdependent, comprehensive systems working coherently toward the common goal. Component systems such as curriculum and assessment, induction and mentoring, educator effectiveness, and professional learning work together to ensure that students have consistently high quality teaching and learning each day. Technology contributes to the success of the broader system and its individual component systems. For technology to add value to professional learning, it must be embedded into a comprehensive system for professional learning.

The promise of technology-enhanced professional learning can seduce consumers with pitches describing low-cost professional



learning, reduction in staff needed to support professional learning, increased opportunities for professional learning, more frequent feedback, and greater access to resources and support. Without a doubt these are attractive features, especially as the demand for professional learning increases and available funding and personnel to support it are diminishing. Yet to achieve the promised benefits, technology-enhanced professional learning, like all forms of professional learning, must be driven by a purposeful plan that aligns with the improvement goals and expectations for performance and student learning outcomes, and it must support learning through all phases of acquisition, application, and analysis of results. Without a comprehensive system to guide decisions about and quality of professional learning, the potential benefits may be compromised and resources squandered. As educators strive to implement Common Core standards and other major reform efforts, professional learning has never been more important. Without thoughtful integration of technology to support professional learning, the opportunities it provides may be lost if the technology is misaligned to the goals for student and educator learning; if the selection process does not include probable users and has limited criteria; and if inadequate support for full use of the technology to implement the learning are unavailable.

Common Core standards demand more from educators and students. The standards call for increased rigor in learning, higher expectations, more real-life application of learning, and increased critical and creative thinking skills. To achieve learning outcomes, the Common Core standards identify and prepare students for new forms of assessment that require demonstration of learning, teachers need to shift classroom curriculum, assessment, and instruction. These changes require teachers to implement inquiry-, problem-, and project-based learning tasks within their classrooms, promote more collaborative work among students, engage students in deep text analysis and critique, require deeper levels of learning, support construction of knowledge through explanation and reasoning, and demand more expository and argumentative writing. In the last decade, many states and school districts, driven by No Child Left Behind accountability measures, reduced student expectations and curriculum standards to discrete,

isolated learning expectations. Common Core standards set a much higher bar for student learning and require revamping of state, district, and classroom curriculum.

These changes in student expectations mean changes in teacher practice and in the practices of those who support them. The changes also require three forms of professional learning to prepare and support educators as they engage in shifting their practice. Individual professional learning focuses on the personal learning goals and unique needs of individual educators. School- and team-focused collaborative professional learning supports school- or team-improvement goals for student achievement. Program-focused professional learning supports the initiation, implementation, and institutionalization of new programs or initiatives, of which Common Core standards, new assessment systems, or new educator effectiveness systems are examples. Because the amount of professional learning required is significant, the more traditional, face-to-face approaches to professional learning cannot meet the demand or the unique needs of all educators. An initiative as significant as implementation of Common Core standards is the ideal time to integrate technology into professional learning.

Technology supports all three types of professional learning when it is used effectively and integrated into a comprehensive plan for professional learning. Without thoughtful integration, technology may not fully contribute to achieving the goals for individual, team, school, district, and state improvement and program implementation.

To select and implement technology as a resource for professional learning, those who lead, plan, and implement professional learning, along with those who participate in it, can increase the likelihood of realizing its benefits by becoming savvy, critical consumers and engaging in thoughtful selection, planning, implementation, and evaluation of available technology products and services. The process begins with assessing student and educator learning needs based on the expectations of Common Core standards, establishing explicit student and educator learning goals, and selecting the most appropriate learning design to achieve the educator learning goals.



# TECHNOLOGY-ENHANCED PROFESSIONAL LEARNING MEETS STANDARDS

**T**o be effective, technology-enhanced professional learning, just like face-to-face professional learning, meets the **Standards for Professional Learning**. The standards synthesize nearly three decades of research on professional learning and identify the attributes of professional learning that improves educator practice and student achievement. Using Standards for Professional Learning as a guide, the table on the following pages provides guiding questions to consider when making decisions about the integration of technology-enhanced learning products and services for professional learning.



## Criteria for Selecting Technology-Enhanced Professional Learning

Standards for Professional Learning	Core Elements	To what degree does the technology-enhanced product or service (Note: The type of product or service and its intended outcomes may require that some indicators have greater priority than others. Thoughtful examination of all indicators prior to review will assist reviewers to prioritize the indicators for their identified purposes and intended outcomes.)
<p><b>Learning Communities</b> Professional learning that increases educator effectiveness and results for all students occurs within learning communities committed to continuous improvement, collective responsibility, and goal alignment.</p>	Engage in continuous improvement	<ul style="list-style-type: none"> <li>• Integrate a cycle of continuous improvement for sustained, ongoing professional learning</li> <li>• Analyze educator, student, and school data to identify student-learning needs.</li> <li>• Define educator professional learning goals based on student learning needs.</li> <li>• Select and implement evidence-based designs for professional learning to achieve professional learning goals.</li> <li>• Provide job-embedded coaching and other forms of assistance to support transfer of learning.</li> <li>• Assess and evaluate the effectiveness of professional learning.</li> <li>• Inform ongoing improvement in teaching, leadership, and learning.</li> <li>• Tap external assistance when necessary.</li> <li>• Engage users in repeating the cycle several times within a school year for individual- and team-based professional learning</li> </ul>
	Develop collective responsibility	<ul style="list-style-type: none"> <li>• Facilitate collaboration, resource sharing, networking, and knowledge co-construction for shared learning among large and small teams of educators who share common goals for student success; job-related performance; school, district, and state improvement efforts, etc.;</li> <li>• Promote a culture of collective responsibility for student and peer success.</li> <li>• Tap internal expertise of peers.</li> <li>• Promote collaborative problem solving, inquiry, decision making, and product development to support effective professional practice.</li> </ul>
	Create alignment and accountability	<ul style="list-style-type: none"> <li>• Support achievement of individual, team, school, district or state goals for educator effectiveness and college- and career-readiness for students.</li> <li>• Build in accountability for professional learning and application of learning to improve practice and student results.</li> </ul>

**Criteria for Selecting Technology-Enhanced Professional Learning, cont.**

<p><b>Leadership</b> Professional learning that increases educator effectiveness and results for all students requires skillful leaders who develop capacity, advocate, and create support systems for professional learning.</p>	<p>Develop capacity for leading</p>	<ul style="list-style-type: none"> <li>• Develop leadership capacity of educators, particularly those with formal and informal leadership responsibilities and those who aspire to become leaders.</li> <li>• Promote educator communication with peers and supervisors.</li> <li>• Provide tools for leaders to support effective use of technology for professional learning.</li> </ul>
	<p>Advocate for professional learning</p>	<ul style="list-style-type: none"> <li>• Link professional learning to state, district, school, and individual improvement efforts.</li> <li>• Generate information to inform communication with policy makers, decision makers, educators, and public about the role of professional learning in supporting implementation of Common Core standards and college- and career-readiness for students.</li> </ul>
	<p>Create support systems and structures</p>	<ul style="list-style-type: none"> <li>• Provide infrastructure that facilitates effective professional learning.</li> <li>• Incorporate data and information management for professional learning.</li> <li>• Provide planning, analysis, reflection, and evaluation tools for professional learning.</li> <li>• Align with established goals, plans, and overall professional learning system.</li> </ul>
<p><b>Resources</b> Professional learning that increases educator effectiveness and results for all students requires prioritizing, monitoring, and coordinating resources for educator learning.</p>	<p>Prioritize human, fiscal, technology, material, and time resources</p>	<ul style="list-style-type: none"> <li>• Promote thoughtful use of all resources for professional learning to achieve individual, team, school, district, and state improvement goals.</li> <li>• Reduce dependence of other resources (staff, time, materials, or funding) or increase the efficiency and effectiveness of other resources for professional learning without diminishing effectiveness of learning and results for educators and students.</li> <li>• Increase effectiveness and efficiency of learning process.</li> </ul>
	<p>Monitor resources</p>	<ul style="list-style-type: none"> <li>• Collect data about effectiveness and efficiency of professional learning and results.</li> <li>• Generate analyses of resource use to inform revisions, planning, and evaluation of professional learning.</li> </ul>
	<p>Coordinate resources</p>	<ul style="list-style-type: none"> <li>• Develop cross-program, school, district, and state integration of resources for professional learning to maximize benefits, increase efficiency and return on investment, and expand use.</li> <li>• Expand resources available for professional learning.</li> <li>• Provide single point of entry all resources, information, and data for professional learning.</li> </ul>

**Criteria for Selecting Technology-Enhanced Professional Learning, cont.**

<p><b>Data</b> Professional learning that increases educator effectiveness and results for all students uses a variety of sources and types of student, educator, and system data to plan, assess, and evaluate professional learning.</p>	Analyze student, educator, and system data	<ul style="list-style-type: none"> <li>• Collect data from multiple sources.</li> <li>• Provide analysis of data collected to inform decisions about learning needs, goals, content, and processes.</li> <li>• Create learner profile and goals for individual, team, school, district, and state professional learning.</li> </ul>
	Assess progress	<ul style="list-style-type: none"> <li>• Incorporate identification of benchmarks and indicators for progress toward professional learning goals.</li> <li>• Use data to measure progress toward professional learning goals.</li> <li>• Provide recommendations for interim adjustments to achieve professional learning goals.</li> </ul>
	Evaluate professional learning	<ul style="list-style-type: none"> <li>• Collect data to evaluate the effectiveness, results, and efficiency of professional learning.</li> <li>• Provide analyses to inform decisions about future planning for professional learning.</li> <li>• Support analysis of data for individual, team, school, district, and state evaluation of professional learning.</li> </ul>
<p><b>Learning Designs</b> Professional learning that increases educator effectiveness and results for all students integrates theories, research, and models of human learning to achieve its intended outcomes.</p>	Apply learning theories, research, and models	<ul style="list-style-type: none"> <li>• Use a research-based approach or theoretical framework for learning process.</li> <li>• Integrate principles of human learning.</li> <li>• Demonstrate respect for professional educators.</li> </ul>
	Select learning designs	<ul style="list-style-type: none"> <li>• Integrate multiple learning designs to address learner preferences and needs.</li> <li>• Integrate learning processes that parallel expected outcomes for educators.</li> <li>• Provide models of exemplary practice.</li> <li>• Maximize the use of technology to increase effectiveness, efficiency, and results of professional learning.</li> <li>• Differentiate to accommodate learner preferences, backgrounds, experiences, environment, technology skills, and identified needs.</li> <li>• Support options for learner choice in content and process.</li> <li>• Build flexibility in learning pathways and processes.</li> <li>• Meet ADA or web-content accessibility standards.</li> <li>• Support ease of use and navigation.</li> <li>• Provide evidence of success in other schools, districts, states, and education agencies.</li> </ul>
	Promote active engagement	<ul style="list-style-type: none"> <li>• Engage learners in constructing knowledge.</li> <li>• Require demonstration of learning through product development, application to practice, and evidence of results.</li> <li>• Integrate ongoing reflection, analysis, critique, evaluation, and synthesis of information, ideas, principles, concepts, practices, etc.</li> <li>• Create multiple opportunities to practice application of learning in different settings.</li> </ul>

**Criteria for Selecting Technology-Enhanced Professional Learning, cont.**

<p><b>Implementation</b> Professional learning that increases educator effectiveness and results for all students applies research on change and sustains support for implementation of professional learning for long-term change.</p>	Apply change research	<ul style="list-style-type: none"> <li>• Use research on change to promote implementation of learning.</li> <li>• Support professional learning through all phases of the learning process including acquisition, application, and analysis of results and continuous refinement to achieve mastery.</li> </ul>
	Sustain implementation	<ul style="list-style-type: none"> <li>• Promote mastery and refined use of learning .</li> <li>• Define explicit expectation for learning and application of learning.</li> <li>• Provide exemplars of application of learning as models.</li> <li>• Provide access to personalized support for implementation.</li> <li>• Provide support over multiple years to achieve full and accurate implementation of new learning.</li> </ul>
	Provide constructive feedback	<ul style="list-style-type: none"> <li>• Provide continuous formative feedback based on explicit criteria.</li> <li>• Provide feedback from peers, supervisors, and experts.</li> <li>• Incorporate system to request feedback on specific processes, products, or other aspects of the learning process.</li> <li>• Integrate self-analysis and reflection as a part of the learning process.</li> <li>• Link feedback with next-step actions.</li> </ul>
<p><b>Outcomes</b> Professional learning that increases educator effectiveness and results for all students aligns its outcomes with educator performance and student curriculum standards.</p>	Meet performance standards	<ul style="list-style-type: none"> <li>• Align educator learning goals and content with performance expectations and standards.</li> <li>• Align learning goals and content with identified learner needs.</li> <li>• Promote high-level of educator performance.</li> <li>• Deepen educator content knowledge.</li> <li>• Expand instructional practices.</li> <li>• Integrate pedagogical content knowledge.</li> </ul>
	Address learning outcomes	<ul style="list-style-type: none"> <li>• Align educator learning goals and content with student learning outcomes as defined in Common Core or college- and career-ready standards.</li> <li>• Align educator learning goals and content with identified student learning needs.</li> <li>• Promote high level of educator performance to achieve student learning goals and standards.</li> <li>• Expand educator expertise to meet the academic, cultural, language, family, and social needs of all students.</li> <li>• Develop strategies to guarantee equity in learning for all students.</li> </ul>
	Build coherence	<ul style="list-style-type: none"> <li>• Build on previous experience and background of educators.</li> <li>• Link initiatives, resources, and talents across multiple initiatives, programs, and improvement efforts.</li> <li>• Promote synthesis of learning across multiple learning experiences.</li> </ul>

# TECHNOLOGY EXAMPLES

**D**escribed below are several types of technology-enhanced professional learning to support implementation of Common Core standards.

## **Instructional support systems.**

*When a team of 6th-8th grades social studies teachers needed model learning tasks that engaged underperforming students in critical analysis of informational text, they accessed the state's instructional support system to locate examples from other teachers across the state, analyzed several examples for the criteria they wanted to meet, and then selected two to modify to align to the interests of their specific student population.*

Common Core standards require revision in classroom curriculum, learning tasks, and formative assessments. Technology provides vehicles for collaborative development, peer and expert review, revision, and archiving of instructional tools and resources to support classroom changes required by Common Core standards. When instructional support systems incorporate data tracking tools and links to student and educator data systems, they provide information to school and district leaders on areas of need, use of the tools, and feedback on the effectiveness of the tools. This form of shared infrastructure, enabled with technology and directly aligned with a state's or district's core academic standards and instructional framework, provides individuals, teams, and large groups professional learning to achieve individual, school, district, and state improvement goals.

## E-coaching and mentoring.

*A veteran math teacher worried that her approach to instruction was not helping her students meet the new standards. She didn't have the strategies to probe their thinking, help them sustain investigation, and be able to explain and demonstrate their thinking. She was also uneasy asking for help from her peers. She accessed the district's e-coaching program to get personalized learning and support to implement new practices in her classroom.*

Platforms, products, and tools that provide one-on-one personalized coaching and mentoring using live, remote, or archived video support increase the relevance of professional learning. These resources give educators opportunities to seek specific support related to curriculum, content, instruction, classroom or school or culture, or leadership practices in a safe environment without fear of evaluation or judgment. When these resources link directly to student learning outcomes and educator performance standards, they are more useful.

## Networks.

*High school principals in the district wanted to shift the responsibilities of department chairs within their schools. They used online document editing tools to develop a new job description collaboratively. Once the new teacher leaders assumed their new roles, principals used a private online community to share, analyze, and reflect on ways to support the teacher leaders, engage in problem solving, and develop their expertise in coordinating the services of these teacher leaders across their schools.*

Learning is rarely a solo experience. Tracy Benson, et al. (2012) comment, “Indeed, one of our biggest lessons from working over two decades in helping teacher leaders and administrators is the leverage that lays in the never-ending work of building a true learning culture where all people – teachers and administrators, adults and students – continually learn with and from one another, what one of us has called a ‘densely developmental organization’ ” (p. 4). Learning

occurs in multiple ways. It can occur in engaging in new experiences, learning from others, and learning from courses and materials. Educators have always valued learning from peers as an important part of their professional development. In fact, many educators prefer learning from peers rather than from external experts who are unknown to them or lack credibility. Networking tools that connect people with ideas and one another offer opportunities for educators to access information to address specific needs. Networks promote shared understanding, collective responsibility, and a sense of collegiality.

### Professional learning resource system.

*The 3rd-grade team had 12 ELL students, a number that far exceeded the two or three they have had in previous years. Teachers recognized the need to expand academic and content-specific vocabulary development in their classrooms to increase the achievement levels of the ELL and all students. They accessed the district's professional learning resource system to find video-based examples, podcasts, and several online courses on the topics of meeting the learning needs of ELL students in the early elementary grades and academic vocabulary. Together they generated the questions they wanted to answer, divided up the resource list among them, individually reviewed the online resources, and shared information and strategies with each other and discussed how to apply them in their classrooms. After applying several strategies, the team compared their results to identify which were most successful for ELL students.*

Effective professional learning meets the needs of the learners. Sometimes learners' needs are specific and urgent. When learning resources are easily accessible, educators can more quickly access the information they need to meet their unique or personalized needs. Useful information systems for professional learning are searchable, aligned with adopted standards for student learning, provide multiple examples to meet a variety of student learning needs, and provide research- or evidence-based information. Professional learning resource systems that integrate with instructional support systems and educator and student data systems provide coherent, aligned support for educator effectiveness. Advances in meta-tagging and common ontology enhance search functionality and will increase usefulness of professional learning resource systems.



## Video capture and analysis.

*Middle and high school math teachers in one district recognized inconsistency in student achievement in algebra courses. Data pointed to certain teachers and schools that were outperforming others. Teachers requested that the teachers whose students consistently outperformed other teachers' students capture their instructional practices on video so other teachers could examine them. After the videos were captured, small groups of teachers reviewed one or two teaching episodes to identify practices they thought influenced student learning and that were not typically present in their own classrooms. Teachers came together to discuss the strategies, view short examples of each of the practices from several different teaching episodes, and discuss how to integrate the practices within their own classrooms.*

Analysis and feedback increases effectiveness by helping educators refine their practice. Many schools and districts lack the personnel to provide the amount of feedback needed to support full implementation of new instructional practices. Instead they turn to alternative approaches that include video capture and software-based analysis and feedback, or self-, peer-, supervisor-, and expert- analysis and feedback on practice captured in video.

## Information organizing tools.

*The district curriculum leaders wanted to provide teachers with web-based resources that they had vetted for alignment with the district curriculum and the level of rigor they needed to support implementation of Common Core standards. The curriculum leaders examine multiple pin-board, digital organizers, curation, and bookmarking programs to find one that would provide the best tool for organizing web resources for teacher use. Once they selected one to pilot, they created common categories for organizing information, established common tags to use in marking the sites they found, and developed a map to guide teachers' access to information.*

Information grows exponentially. It is no longer possible to remember or even use everything relevant to a particular learning need. Teachers simply do not have time to search for, select, analyze, and organize all available information to support effective instruction and learning. They benefit when technology-based resources to promote effective practice and learning have been selected; reviewed for validity, reliability, depth, and alignment with adopted curriculum; and care-

fully organized for easy access. Information organizing tools can be used for shared or individual collections of information.

## Games and simulations.

*Elementary school teachers' existing instructional practices in mathematics depended on an algorithmic approach showing students one way to achieve a right answer and then testing students in applying the algorithm to a set of similar problems. Clearly they needed to shift their instruction to meet the expectations of Common Core standards. They used a math classroom game-based simulation to try out different strategies for interrogating student thinking. The game presented a number of students, allowed teachers to select one, ask a probing question, and pose follow-up questions based on the responses the student gave, and to declare when the student achieved mastery. Game feedback provided information to teachers to reflect on their choices.*

Games and simulations provide safe and instructive environments for practice and receiving feedback. Those that more closely resemble real-life classrooms are obviously more instructive than those that do not. Development of sophisticated games and simulations that adjust with the moves of the players and support cross-functional teams of multiple players are currently expensive and time-consuming to develop, however further development in neuroscience, cognitive patterning, and technology will place these tools in the hands of educators and students for enhanced learning. Games and simulations further enhance learning when players use affinity sites to explicate their moves, unpack and explain the content and skills used while playing the game, and describe how they will apply their learning in their own practice.

## Data analytics.

*District leaders continue to populate the district's instructional support system with new resources and want to learn how teachers and principals are accessing and using the resources and which are having the greatest impact on teaching and student learning. Data analytics embedded into the instructional support system provide reports that district and school leaders use to improve resources, provide support to teachers on how to access the new resources, and strengthen the effects of the resource use. By tracking the use of technology-based resources, leaders are able to extend and expand use and realize the full power of technology to improve teaching, leading, and learning.*

Educators continue to search for new ways to provide real-time data to educators to inform decision making to adapt practice to the needs of students and other educators. Technology facilitates data analysis and use of data. In addition, underutilized technologies provide information on how educators access technology, how it informs educator decisions, and the impact on students and other educators.

## Online courses, conferences, webinars, videos, and podcasts.

*Superintendents participating in a statewide learning network were engaged in a book study of a new book on leadership in 21st century organizations facing adaptive changes. The book was written primarily for leaders in business and industry. They watched several different TED talks by the author as they grappled with applying all the concepts to their work as leaders in education. The network facilitator reached out to the author and invited her to participate in a webinar with the superintendents to address their questions and to apply the learning to their everyday work. Using an online videoconferencing site, the author connected with the network leaders for a discussion of the key ideas in her book.*

Technology tools enable people to connect for learning-focused discussions and to explore ideas from multiple perspectives and in multiple presentation formats. When learners are able to interrogate information, ideas, positions, and people, they clarify, expand, and deepen learning. Technology bring learners closer to the source of ideas, information, and positions to promote higher levels of learning.

The examples of how technology enhances learning are abundant. However, as individual experiences they represent only one component of professional learning. Successful professional learning draws from everyday work experiences, collaboration with others, and formal learning experiences such as courses, conferences to promote acquisition of knowledge, skills, practices, and dispositions, application of learning, analysis of results, and frequent, focused constructive feedback for ongoing refinement. The learning experience is complex, multi-faceted, and requires opportunities to learning in authentic experiences and through multiple live and online channels of information processing. Consequently, **technology is not a substitute for professional learning. Rather it is a tool to enhance, expand, deepen, and facilitate learning to increase effectiveness, efficiency, and results.**

# COMMON LIMITATIONS AND WAYS TO AVOID THEM

**W**ith its many strengths and benefits, there are limitations to technology-enhanced professional learning. These limitations can be mitigated with careful planning, ongoing support, and constant monitoring, analysis, and evaluation.

**Misuse of technology.** As the cost of technology continues to decline and its availability increases, it is even more important to consider how technology will support educator learning. The misuses of technology can occur in multiple ways such as using technology to substitute for all forms of professional learning; adding technology as a resource for professional learning without embedding it into a comprehensive plan for professional learning driven by a vision, definition, and standards for all professional learning, and ongoing evaluation; and providing technology with no support for applying learning into practice and constructive feedback to refine practice over time. To avoid these and other misuses, the introduction or expansion of technology-enhanced professional learning requires first a comprehensive plan for professional learning to guide the thoughtful selection, planning for implementation, ongoing support for use of the resources and application of learning, and formative and summative evaluation of technology-enhanced and all other forms of professional learning.

**Disconnected from other support systems.** Sitting on the side disconnected from other information and data systems, technology-enhanced professional learning has less potential to realize its many

benefits. When integrated with student and educator data systems, technology-enhanced professional learning connects educators with information they need to assess their professional learning needs and provides them the data to monitor and assess progress toward their professional improvement goals. Integration of systems to increase their value and functionality is a core responsibility of system developers. Technology developers maximize system integration to increase use and benefits of their products and services rather than limit access or require convoluted add-on modules to link systems.

**Inadequate support for learners.** Any new tool or resource typically requires a minimum level of introduction to explain how it works and can benefit the users. Technology-enhanced professional learning resources require some level of support for new users to build basic understanding and to promote further experimentation. For those more comfortable with technology, online help services may be sufficient. For those less comfortable, online and onsite support may be needed. For any professional learning to add value, educators must receive sustained, ongoing support to reach full implementation of their learning to improve practice and increase student success. Some technology-enhanced professional learning builds in ongoing, sustained support and feedback to achieve mastery of the learning and to continually refine and improve practice. For others, this support must be provided as a supplement to the technology.

**Limited implementation planning.** Too frequently, technology resources are purchased because they promise results. Indeed, many technology-enhanced professional learning resources have benefits. To realize these benefits, however, purchasers have a responsibility to develop, implement, monitor, and evaluate technology-enhanced professional learning just as they would any other professional learning. Access alone will not turn into use and results for educators and students. To achieve full benefits of any professional learning, including that which occurs through technology, those making decisions about professional learning need to establish clear expectations for use, support in using the resources, monitor use and effectiveness, identify and address barriers to use, and provide extended opportunities to educators on how to take full advantage of the resources to strengthen practice and student results.

# PAVING THE WAY FOR SUCCESS

**Integrate technology into a comprehensive professional learning system.** The purchase of any professional learning resource follows the development of a comprehensive plan for professional learning that aligns directly to individual, team, school, district, and state improvement goals. Embedded as a component of the plan, technology has the potential to boost access to and effectiveness of professional learning. When dropped without full integration into a comprehensive plan, technology has the potential to fragment focus, distract learners, and waste resources. **Implementing technology as a part of a comprehensive professional learning system requires thoughtful decision making and deliberate actions at all stages—selection, implementation, and evaluation.**

**Careful selection process.** As with any purchase, **understanding what the intended purpose of the new product and developing clear criteria for selection that integrates probable users' perspectives are important first steps of the selection process.** Buyer's remorse can be avoided by investing time and engaging users in the selection process. The selection process requires deep understanding of the student achievement and/or overall improvement goals to be achieved from use of technology, the needs to be addressed with technology, characteristics and expectations of intended users, the context in which the use will occur, parameters of cost, investment the purchaser is willing to make to support implementation, and the formative and summative indicators of effectiveness that will guide the evaluation of the product or service.

**Joint purchasing agreements.** Schools, districts, and states have limited funding for investments in professional learning, and those resources have been declining for several years. Technology is frequently viewed as a way to address increased demands with limited budgets. **Tapping the potential of collaborative purchasing agreements across districts, regions, within the state or even across states can add value to the investment in technology both for the provider and the purchasers.** Districts and states can take advantage of joint purchasing agreements by agreeing to a set of basic functionalities that allows states to add on modules to meet their unique needs. For purchasers increased volume may mean smaller per-user costs. For providers joint agreements mean broader use of their products and services and reduced costs for support as a result of the users being based in a defined region.

**Ongoing support for use and application of learning.** **As with all professional learning, technology-enhanced professional learning realizes its potential when it improves educator practice and increases results for students.** Results require application of learning, and application of learning requires job-embedded assistance and constructive feedback to refine use. Those acquiring technology for professional learning plan for implementation support as a part of their purchasing costs and integrate it into the implementation, monitoring, and evaluation plans.

Technology is changing the face of learning for students and professional learning for educators. It alters relationships between learners and ideas, between learners and their “teachers, and among learners” (Johnson, Adams, & Cummins, 2012; Killion, 2010). Dynamic, interactive, focused, well-designed technology, when integrated into a comprehensive system for professional learning, increases educators’ opportunity to learn, supports personalization of learning, promotes active construction of knowledge, manages information and data, and provides information and feedback when and where it is needed. As advances in technology continue to grow and individuals, schools, districts, and states seek new ways to expand professional learning,

they will turn more frequently to the many innovative, technology-enhanced professional learning products and services available from for-profit, nonprofit, associations, universities and colleges, regional education agencies, districts, and state education departments. To achieve the full benefits technology offers for professional learning, those making purchasing decisions and supporting implementation have significant responsibility to make informed decisions and provide sufficient, sustained support to achieve full implementation.





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