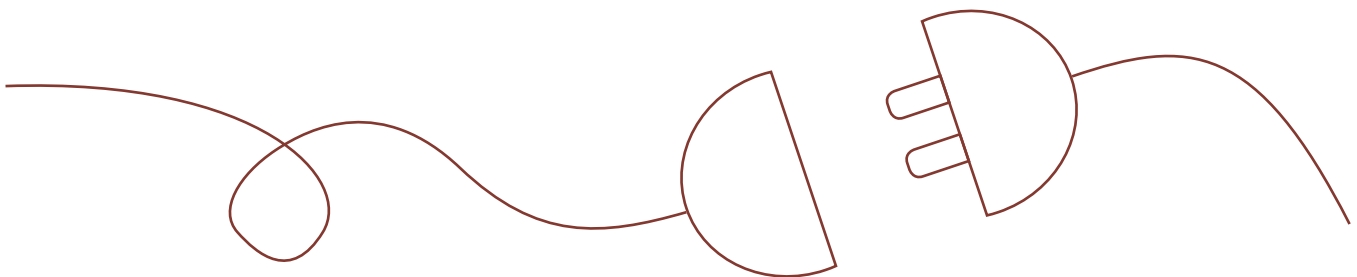


Technology, Coaching, and Community

Power Partners for Improved Professional
Development in Primary and Secondary Education

An ISTE White Paper, Special Conference Release



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Executive Summary

SITUATION: Effective use of technology is essential for learning and teaching in a global, digital age.

Technology is at the core of virtually every aspect of our daily lives and work, and we must leverage it to provide engaging and powerful learning experiences and content, as well as resources and assessments that measure student achievement in more complete, authentic, and meaningful ways. Technology-based learning and assessment systems will be pivotal in improving student learning and generating data that can be used to continuously improve the education system at all levels. (National Education Technology Plan, 2010).

When teachers do not effectively integrate all aspects of technology in the educational process, today's students are not fully engaged and miss out on authentic learning experiences emphasizing collaboration, creativity, and innovation. This leads to students who are unprepared to be productive digital-age citizens and participants in the highly competitive, global, digital workplace.

PROBLEM: Many teachers do not know how to design and support technology-rich learning environments.

A recent study commissioned by the Richard W. Riley College of Education and Leadership states that teachers who use technology frequently to support learning in their classrooms report greater benefits to student learning, engagement, and skills from technology than

teachers who spend less time using technology to support learning, especially in the area of 21st century learning (Grunwald Associates, 2010).

The report also stated that, despite this powerful finding, just 34% of the 1000 teachers surveyed use technology 10% of class time or less.

The International Society for Technology in Education (ISTE®) is the premier membership association for educators and education leaders engaged in improving learning and teaching by advancing the effective use of technology in primary and secondary education and teacher education.

Just giving a teacher a technology tool and expecting him or her to maximize its learning potential is a strategy destined for failure. A majority of teachers, including those raised in a digital age, do not have the knowledge or skill set to use technology effectively to maximize student learning. Additionally, as Baby Boomer generation teachers retire and are replaced by Millennial Generation educators, professional development (PD) methodologies must adapt to match the learning styles of the Millennial teacher. Researchers Wong and Wong report a

disconnect between the delivery of many lock-step PD models by Boomer-aged PD specialists and the collaborative learning style of the Millennial. Finding effective ways to reach all teachers with meaningful professional learning is essential in order to deliver a savvy and competitive workforce able to maximize student learning with technology.

SOLUTION: Coaching, combined with communities of learning, is a highly effective job-embedded PD model.

Effective professional learning is intensive, ongoing, focused on the classroom, and occurs during the teacher's workday (Darling-Hammond, 2009). Additionally, Michael Fullan's work on educational change (2008) emphasizes that we need to "connect peers with purpose" if we want to see systemic improvement in student learning and professional learning. We must allow educators to routinely collaborate with trusted colleagues to solve problems and share ideas.

ISTE recently convened a small group of distinguished leaders to share the success they were having with PD models that integrate context, collaboration, and technology. In analyzing their success, three essential concepts emerged. The most effective PD was:

1. Technology-rich,
2. Delivered through a coaching model, and
3. Enhanced by the power of community and social learning.

ISTE believes the convergence of technology, coaching, and community (social learning) is essential to model learning and teaching effectively in a connected, global society. This paper focuses on a synergistic and powerful PD partnership based on these three essential concepts.

RESULT: Teachers experience technology as an effective tool for professional learning and develop the skills to powerfully use technology to improve student learning.

Coaching support for teachers is a powerful means of both modeling and harnessing the potential of technology to improve teaching and learning. Teachers who receive coaching in the use of technology tools to improve student learning, and who learn from and collaborate with peers via professional learning communities, will develop confidence and effectiveness in designing and supporting technology-rich environments that maximize student learning.

The Transformation of Professional Development for a New Digital Generation

Professional development is a critical element in systemic reform and in enabling teacher success. A recent survey of professional development trends reported that the average teacher within the United States received 25.4 hours of PD annually (Resnick, 2010). The survey also stated the average school district invests \$225,200 annually in PD. Projecting that out to the approximate 16,000 school districts within the United States, PD is likely at least a \$3.6 billion dollar industry. With such an investment, it is prudent to think about how that expenditure relates to global, digital age learning. Let these three facts guide your thinking:

- Teachers are interacting with students who spend an average of seven hours and 38 minutes using entertainment media each day, primarily outside of the classroom (Kaiser Foundation, 2010).
- The demographics of teachers are shifting rapidly. Over the past five years, more than half of the veteran teachers within the New York City school district have been replaced with teachers who have five years of teaching experience or less (Wong and Wong, 2010).
- Social learning and networking features on Internet sites have been rapidly adopted and embraced throughout the world as a legitimate resource for learning.

Research and applied practice are giving us a clearer picture of what makes professional learning effective. A recent study argues that effective professional learning is intensive, ongoing, focused on the classroom, and occurs during the teacher's workday (Darling-Hammond, 2009). Context is critical. Learning in context means learning in the classrooms where teachers practice their craft, and focusing on classroom activities

that will help educators meet their students' needs (Elmore, 2004). Additionally, Michael Fullan's work on educational change (2008) emphasizes the need to "connect peers with purpose." To achieve systemic improvement in student learning, professional learning is most effective when educators routinely collaborate with trusted colleagues to solve the problems they face in their classroom.

Trends in using social media tools, Internet transmitted voice and video communication, and blogging support informal learning and strengthen human connections. These same forms of learning and community building lend themselves well to focused, job-embedded, professional learning. By combining what we know about effective professional learning with trends for using technology for informal community building and learning, a sustainable ecosystem will form: highly effective, engaging, and relevant environments for professional learning that were not possible before the rise of readily available access to information and communication technology.

ISTE recommends incorporating a three-pronged methodology to achieve 21st-century professional learning experiences, which will better prepare teachers to effectively help students learn. This methodology embraces:

- An effective coaching model;
- Online communities for greater collaborative idea sharing; and
- A fully embedded use of technology;

By bundling these three factors into a singular professional learning strategy, instructional leaders can develop a more powerful ongoing learning environment for teachers that bolsters PD and successfully prepares students when they enter the workforce.

This white paper explores the synergies among technology, coaching, and community; provides an integrated model for global, digital-age PD; and offers ISTE's Ten Tips to jumpstart the process. It showcases technology-related coaching programs throughout the world and builds the case for job-embedded PD that leads to professional transformation through active, technology-rich communities of practice.

Transformational Professional Development

PD models that take advantage of the convergence of coaching, community, and technology support the implementation of technology as described in the United States National Education Technology Plan. They:

- Offer teachers an environment in which to practice new skills where they can learn. They will be able to design and execute learning opportunities that enable students to have engaging and empowering learning experiences both in and outside of school to prepare them to be active, creative, knowledgeable, and ethical participants in our globally networked society; and

- Support professional educators individually and in teams by technology that connects them to data, content, resources, expertise, and learning experiences that enable and inspire more effective teaching for all learners (NETP, 2010).

Think of technology innovation as a multiplying factor. The National Educational Technology Plan recommends a team-driven approach for professional learning. Coaches tend to be natural networkers, yet many are physically isolated. They need support mechanisms to connect. Technology can provide a multi-tiered support structure for technology integration to strengthen the coaching profession, and certainly millennial teachers actively want to learn and coach one another through connected and collaborative learning. Online support can offer:

- A network of coaching professionals;
- A vehicle for teachers to share with those having similar interests or challenges; and
- Aggregated resources that support programmatic and operational excellence.

In this type of model, classroom educators are fully connected to learning data and the tools for using the data; to content, resources, and systems that empower them to create, manage, and assess engaging and relevant learning experiences; and to their students in support of learning both in and out of school. The same connections give them access to resources and expertise that improve their own instructional practices and guide them in becoming facilitators and collaborators in their students' increasingly self-directed learning (NETP, 2010). Online learning communities serve as an interactive extension of a school-based coaching effort. The learning ecosystem is organic. As each coach and teacher interacts, relevant connections emerge.

ISTE NETS: New Technology Standards to Support Coaching in an Online, Digital Age

The ISTE NETS have served as a vehicle for identifying and benchmarking performance for students, teachers, and administrators. They have been adopted or adapted throughout the United States and in more than 20 countries throughout the world. Just as effective teachers model and apply the NETS•S as they design, implement, and assess learning experiences to engage students and improve learning, coaches will need to model and apply the NETS•T as they build relationships and learning experiences for teachers. And now ISTE is introducing the NETS for Technology Coaches—the NETS•C—to benchmark what coaches should know and be able to do to effectively help teachers develop their confidence and effectiveness in designing and supporting technology-rich environments that maximize student learning.

For a sneak peek of the NETS•C, see pp. 20–21.

Understanding the Importance of Technology, Coaching, and Online Communities

*“Technology should be like oxygen:
Ubiquitous, necessary, and invisible.”*

—CHRIS LEHMAN

Helping students learn in the digital age requires teachers to understand and “leverage the learning sciences and modern technology to create engaging, relevant, and personalized learning experiences for all learners that mirror students’ daily lives and the reality of their futures” (NETP, 2010). Research has shown that educators are more likely to incorporate technology into their instruction when they have access to coaching and mentoring. (Strudler & Hearnington, 2009). Teachers who have experienced technology as a teaching tool for professional learning, and who in the process have developed the skills for powerful use of technology in the classroom, can greatly improve student learning.

Coaching is one model of PD that has shown the potential to improve the knowledge, skill, and practice of teachers, thus enhancing student achievement.

Educational leaders believe a key indicator of a successful PD effort is clear evidence that teachers are implementing what they’ve learned (Resnick, 2010). If a technology-rich environment is a given, offering job-embedded PD and coaching as a scaffold for ongoing support and growth will allow teachers an opportunity for low-risk practice and lots of feedback. And when teachers can work collaboratively to share ideas and improve teaching practices, a community of practice can emerge to provide a scaffold for support and

growth. The effectiveness of coaching for the classroom was demonstrated in a 2004 study by the University of Kansas Center for Research on Learning, which found instructional coaching significantly increased the implementation rate of newly learned practices that showed promise for improving student performance. This study indicated that without support and follow-up, teacher implementation of new instructional methods is only about 15 percent (Joyce & Showers, 1983), but with the addition of coaching, implementation increased to 85 percent (Knight, 2007).

A further ingredient needed for effective PD is “coherence,” which is defined as “a consistency between a teacher’s beliefs and knowledge and the actual learning that takes place in the PD process” (Desimone, 2009). Coaching contributes to coherence by giving teachers a chance to receive additional support, helping them to reconcile their PD content with their personal beliefs and knowledge. When coherence is combined with a growing population of millennial-generation teachers who are accustomed to collaborative idea sharing, the case for the convergence of technology, coaching, and community becomes clear.

What is Coaching?

According to Harry Wong, a San Francisco Bay Area educator and coaching expert, the responsibility of coaches is “to help maximize personal and professional potential, while concomitantly upgrading their own professional proficiency. Coaching is customized and focused on providing instruction on what needs to be accomplished. Coaches tailor support, assess each teacher’s progress with observations, use interviews and surveys, and have follow-up visits. Teachers feel more motivated and responsible to act on new skills because coaching makes them personalized and customized on an ongoing basis” (Wong & Wong, 2008).

Coaching becomes a more effective model for today’s educator because it builds a distinct level of mutual respect and trust with the individual being coached, translating into a more effective learning environment.

For coaching to yield the greatest opportunity for success, it must incorporate three essential components:

1. **Context.** Coaching practices must be in context with what can be used immediately.
2. **Relevance.** Coached information must be highly relevant to the lessons currently being taught.
3. **Ongoing.** Coaching support must be provided on a day-to-day basis where teachers can practice newly learned skills and ensure the highest potential for success.

The Importance of Community

“To create a professional learning community, focus on learning rather than teaching, work collaboratively, and hold yourself accountable for results.”

—RICHARD DUFOUR

The electronic convergence of resources, tools, and social networks offers real-time support for individuals and groups and can ably serve as a catalyst for growth. This ever-expanding network gives us a legitimate opportunity to essentially leverage the world! Web 2.0 learning environments are now capable of delivering a customized, demand-driven approach to professional learning. Such a presence can offer teachers and coaches an opportunity to develop an online professional learning community (PLC). PLCs are active onsite within many school districts, yet the majority of teachers have yet to reach beyond the borders of their districts to expand their communities through online PLCs.

Social learning has become a legitimate and powerful force in advancing people’s knowledge and interests. In studies of web-based communities of practice centered on knitting, cooking, or other personal or professional interests, one will find these communities a buzzing hive of activity. The knowledge that awaits learners is relevant and readily

available when they need it. The ability to connect with someone who has just finished a project that another individual may want to take on is powerful. Bandura's Social

Social learning has become a legitimate and powerful force in advancing people's knowledge and interests.

Learning Theory posits that people learn from one another, via observation, imitation, and modeling—and this theory is borne out by these informal communities of practice.

What happens when you combine **intensive, ongoing, learning-focused professional development** and **connecting peers with purpose** via social learning? You end up with a highly effective professional development model that combines the power of technology

with the power of coaching and learning communities. The following three coaching models demonstrate this important synergy in action.

Three Coaching Models That Provide Highly Effective Professional Development

Educator-focused PD that leverages technology with the principles of the ISTE NETS requires the inclusion of one or more of three different collaborative-oriented coaching initiatives: cognitive coaching, instructional coaching, and peer coaching. Let's take a look at each one in turn.

MODEL ONE: Cognitive Coaching

Cognitive coaching is defined as a set of strategies, a way of thinking, or a way of working that invites self and others to shape and reshape their thinking and problem solving capacities (Costa & Garmston, 2002). Art Costa and Bob Garmston originally developed the model for Cognitive CoachingSM. Their intent was to enable participants to alter their mental capacity and in turn, modify themselves.

Cognitive coaching is based on four propositions:

1. Thought and perception produce all behavior.
2. Teaching is a constant decision-making process.
3. To learn something new requires engagement and alteration in thought.
4. Humans continue to grow cognitively.

An example of cognitive coaching today are the PD programs at the non-profit enhancing Missouri's Instructional Networked Teaching Strategies (eMINTS) National Center, which is a collaboration between the University of Missouri, the Missouri Department of Elementary and Secondary Education, and the Missouri Department of Higher Education.

The eMINTS program uses an in-classroom approach based on the original cognitive coaching model outlined by Costa and Garmston, which has taught educators how to use technology effectively since 1999. The eMINTS instructional model has demonstrated positive effects on student achievement in more than 3,500 classrooms across the United States, and is one of the few PD programs that has data to support the chain of evidence from the delivery of a specific PD program to changing teacher practice and how it can, in turn, have a positive impact on student achievement.

The eMINTS program works with the Center for Cognitive Coaching to implement its model across all programs so that specialists (both staff and district) have a common language and common methods for coaching and mentoring teachers. Technology enables the work through a Moodle-based community of practice (Moodle comprises software used to produce Internet-based courses and Web sites that support a collaborative framework of education), and periodic e-conferencing sessions with eMINTS staff or coaches.

Teachers receive coaching and mentoring from eMINTS instructional specialists or staff members who have successfully completed the eMINTS “train-the-trainer” program, called “PD for Educational Technology Specialists” (PD4ETS).

A Cognitive Coaching Case Study: The eMINTS Program

A 2010 study conducted by Martin, Strother, Beglau, Bates, and Reitzes used the principles of the eMINTS program to investigate how a similarly designed PD program could leverage extensive in-classroom coaching to impact teacher outcomes and related student achievement.

In the study, teachers taught all subject areas in grades 3–6. They received regular in-classroom coaching over a two-year period where they participated in the eMINTS PD program from a specialist who conducted their PD sessions.

Coaching activities were designed to help teachers translate PD concepts into classroom practice and included modeling instruction, lesson planning, technology assistance, reflective practice, and problem solving around program implementation. Data was collected pertaining to the amount of time specialists spent on each of the activities during their coaching sessions. Teachers were also required to submit lesson plans with student artifacts upon their completion of the eMINTS PD program. Lesson plans were rated using a validated rubric that was part of the program fidelity process.

Third through sixth grade students in classrooms taught by eMINTS teachers completed the Missouri Assessment Program (MAP) tests in math and communication arts (English Language Arts). In the spring of the school year their teachers completed eMINTS professional development as well as the year following completion. Student assessment scores were matched to teacher, fidelity measures, in-classroom coaching data and lesson plan quality data. Demographic information was collected on students including race, gender and free or reduced-price lunch status as a measure of students’ socioeconomic status.

Martin et al. reported on the analyses and confirmed many assumptions found in the program. Specifically, teachers who experienced PD that was delivered as intended by eMINTS developers demonstrated greater understanding of the concepts taught. The research determined that if instructional technology PD focused on aligning instructional

problems and key concepts with applicable technology tools, then both student achievement outcomes and teacher satisfaction increased. It also showed that:

- PD activities need to make explicit connections between specific types of instruction and technology tools, and only then can the technology be linked to increased student learning improvements.
- Well-crafted and targeted PD helps educators who attend such sessions connect that learning to their curriculum and standards and then provides a sound pedagogical approach to delivering their course content.
- High-quality instructional technology PD takes a great deal of time to create. That time should not be minimized or underestimated. One cannot just throw together a set of “cool tools” to demonstrate to educators and hope that something effective will emerge from such a session.
- The research emphasizes that labor intensive, long duration, ongoing coaching and support and a close connection to the teaching and learning practice are essential for PD to have an impact (Houtman, 2010).

MODEL TWO: Instructional Coaching

The Kansas Coaching Project is working with teachers, curriculum and technology directors, and principals to impact student learning through the implementation of instructional coaches (ICs). They tackle this enormous issue by helping schools focus on *what* to target by identifying teaching practices that are likely to have a positive effect on the way teachers teach and the way students learn. The result of this inquiry is the Big Four, a comprehensive framework for instructional excellence made up of practices that are both easy for teachers to implement and powerful in terms of effect on teaching and learning. The Big Four framework is built around the following aspects of teaching: 1. Classroom management, 2. Content planning, 3. Instruction, and 4. Assessment for learning. The Kansas Coaching Project uses instructional coaching as a strategic model for *how* to deliver effective learning for teachers. Coaches use technology actively within their practice.

ICs are also colleagues—friends and confidants who listen with care and share valuable information with teachers at the time when teachers most need it. ICs help teachers focus on what to target by identifying teaching practices that are likely to have a positive effect on the way they teach and the way their students learn.

ICs use a variety of PD procedures to encourage the widespread, high-quality implementation of effective teaching practices, including:

- Holding one-to-one or small group meetings during which ICs can identify how to address their most pressing concerns.
- Guiding teachers through instructional manuals, checklists, and other materials.

- Collaboratively planning with teachers to identify when and how to implement effective instructional practices.
- Preparing materials for teachers prior to instruction.
- Modeling instructional practices in teachers' classrooms and observing teachers when they use interventions.
- Providing feedback to teachers (Knight, 2004).

Research being conducted at the Kansas Coaching Project, a division of the University of Kansas Center for Research on Learning, supports instructional coaching. It characterizes instructional coaching as a philosophical orientation, or the theory that underlies everything found in coaching. The ICs affiliated with the Kansas Coaching Project adopted a partnership theory to shape how coaches act.

Over the past 10 years, the Kansas Coaching Project has identified 7 different practices that ICs use to empower teachers to learn and integrate proven teaching practices:

1. **Enroll.** The teacher chooses whether or not she or he would like to collaborate with the coach.
2. **Identify.** The teacher chooses the teaching practice that he or she would like to learn with the coach.
3. **Explain.** The coach and teacher have a shared understanding of the teaching practice and have agreed upon an observation protocol or checklist describing the components of the teaching practice.
4. **Modeling: “You Watch Me”** The teacher is ready to begin teaching with the new practice.
5. **Observe.** The teacher is comfortable with the coach observing the classroom practice.
6. **Explore.** The teacher is encouraged to continue using the teaching practice and has identified an area where he or she can improve the way the practice is implemented.
7. **Refine.** The learned teaching practice becomes habitual for the teacher.

In a technology-related instructional coaching project for the Enhancing Education Through Technology program at the Kansas Department of Education, a pilot study was conducted by ALTEC at the University of Kansas to integrate technology into math, reading, and science instruction. Preliminary evidence suggests that classrooms were more likely to be engaged in higher-level cognitive abilities, such as Knowledge Representation or Knowledge Construction (Craig Hare, et al., 2009).

Instructional Coaching Case Studies: Pennsylvania and Wyoming

The 21st Century Teaching and Learning/Classrooms for the Future (CFF) instructional coaching program is based on three sources: the work of Jim Knight with the Kansas Coaching Project, the 10 roles of ICs as outlined by Joellen Killion of the National Staff Development Council, and “Levels of Intensity of Coaching” from Dr. Rita Bean of the University of Pittsburgh.

Participating schools in the CFF project are provided with funding to support a half-time instructional technology coach. The coaches volunteer to be guides and supports for other teachers and help them to effectively integrate technology in their lessons and create activities that engage and inspire learners. The program began as a high school reform program that has expanded to grades 5–12. To date, more than 90 percent of the state’s eligible high schools have participated in the program.

This statewide initiative incorporates a blend of face-to-face and online support:

- A three-and-a-half-day boot camp launch event preparing coaches to work in their districts;
- Employing PDE mentors to provide leadership for CFF coach PD throughout Pennsylvania. The program is also providing virtual support to coaches and regional mentors.
- Employing technology Integration Mentors (TIMs) at regional centers throughout the state. Since instructional technology coaches are often the only instructional technology coach in their building or district, it is essential for them to be connected to their peers and others throughout the state;
- Support is provided through listservs, Wikis, Skype, Cover It Live, social bookmarking sites, and Moodle sites that provide places where they could post ideas, participate in discussions, and share links;
- Webinars are also provided on a variety of topics of interest. Instructional technology coaches participated in short, focused PD segments and listened to speakers from their desktops;
- Virtual camps for program teachers and instructional technology coaches during the summer provided an opportunity to learn Web 2.0 technologies and develop instructional units and lessons

Over the course of four years and through an independent evaluation study conducted by Dr. Kyle Peck and Robin Clausen of The Pennsylvania State University, the program has had an impact. Findings include:

- Classrooms are arranged differently (fewer rows and more collaborative groupings of desks).
- Students are spending less time in lectures and are spending more time working independently and in peer groups working on reports, projects, or presentations.

- There are significant increases in the use of activities requiring higher-order thinking, such as project- and problem-based learning, authentic learning, and peer teaching.
- Anecdotal stories indicate that teachers are engaged in more professional learning communities and are more collegial and collaborative.

In 2006 the Wyoming Legislature passed HB 139, which created a program to augment amounts within the education resource block grant model available to districts for school-based instructional facilitators and instructional coaches. In fall 2006, Instructional Coaches were placed at all Laramie County schools affecting approximately 2300 certified and classified employees. This K-12 district reaches into 33 locations covering 1529 square miles in the southeast corner of Wyoming.

Technology Integration Specialists (TIS) have been instrumental in helping Instructional Coaching staff develop capacity to integrate technology into all areas of curriculum and instruction. With the addition of HB 139 and Instructional Coaches being placed at each of the school locations, a decision was made to have the existing Technology Coaches directly support the Instructional Coaches and their use of technology in classroom lesson design. The district held the belief that increasing the technology comfort level of our coaches would have a direct impact on the use of technology within the classrooms. The TIS were required to work with an Instructional Coach a minimum of one half of their work day and spend the additional half of their time working directly with classroom teachers, non-tenured staff, support staff, and administrators. Although the district has not collected formal data on the growth of the coaches, it has seen dramatic increases in technology use by the Instructional Coaches and the teachers that they have been supporting.

MODEL THREE: Peer Coaching

Peer-Ed created a technology-centered, peer coaching approach in 2001 through a U.S. Department of Education Technology Innovation Challenge Grant. Microsoft adopted the program as part of its worldwide Partners in Learning program in 2004, and has provided critical assistance in implementing peer coaching since that date. To date, Peer-Ed team members have trained approximately 1000 facilitators in 49 countries and 250 facilitators in 10 U.S. states.

This particular model of peer coaching focuses on training teachers to help their colleagues integrate technology into the collaborative online classroom of the future. Since a teacher's needs drive and shape collaboration between teacher and coach, the coach's response to the teacher becomes an important part of improving their PD skill-set. Given the relationship between coach and teacher, peer coaching focuses on collaboration as a central component to generate the best possible results.

A teacher's needs drive and shape collaboration between teacher and coach. The coach's response to those needs is what makes coaching so precise and valuable, and what is likely to lead to improved teaching and learning. Precisely, this focuses on collaboration to produce results. As Tran Duc Think, a high school teacher in Ho Chi Minh City who

collaborated with a coach, observed, “Using the Peer Coaching model, my colleagues were ready to take me step-by-step through a project and answer all my questions. Gradually, I became able to organize ... a project so that every student is involved in learning and sees how to explore that knowledge by themselves.”

Mary Knight, Flagstaff’s Director of Technology, agrees with Thinh that coaching works because it focuses on the needs of teachers. “Finding time for sustained professional development is always a challenge. The job-embedded nature of Peer Coaching helps. Also, we align Peer Coaching with other instructional goals so coaches and collaborating teachers don’t see Peer Coaching as a separate goal. Finally, we believe Peer Coaching is the best way to move towards 21st Century Skills development, particularly because of the Peer Coaching focus on lesson improvement.” Knight’s beliefs about the impact of coaching are supported by a recent assessment of the impact of coaching on student’s literacy skills.

Research demonstrates that collaboration among teachers is a key to improving academic achievement, and peer coaching is a proven method for promoting collaboration. Peer coaching brings together facilitators and coaches and focuses on three primary pillars:

- Utilize the communication and collaboration skills needed to build trust and effective collaboration.
- Strengthen coaches’ lesson design skills to help colleagues to improve learning activities so they reflect what they know about collaborative online learning. For many teachers around the world, successful integration of technology means learning to use active, engaging instructional strategies.
- Understand best practices in technology integration so coaches can assist teachers using technology to enrich and enhance student learning.

One of the first stages in Peer-Ed’s model is a discussion between coaches and their colleagues, known as a peer-ed team, to understand their needs and the nature of the collaborative process. Once completed, the peer-ed team transfers ownership for coaching to the schools and the school districts that must ultimately implement the peer-coaching program. There are five stages to the model:

STAGE 1: Assess. The first stages in helping teachers develop and implement a coaching project is determining the teacher’s technology skills and instructional strategies. This information helps the coach and teacher to define a lesson or project that the teacher can successfully implement, or to identify the kind of coaching, resources or skills the teacher might need to carry out the project.

STAGE 2: Set Goals. Setting reasonable and realistic goals that are linked to the school’s educational goals and curricular standards is a critical first step toward establishing a solid coaching relationship and helping teachers integrate information and communication technology into their classroom activities.

STAGE 3: Prepare. Participants learn to use a learning activity checklist to evaluate the strength of a proposed lesson, project or unit. Working in teams, coaches use the checklist to assess the lesson design of a series of activities that are often implemented by classroom teachers.

STAGE 4: Implement Activities. Coaches often find that the teachers they work with benefit from seeing their coach model a technology-rich lesson or team teach a lesson or project with their coach.

STAGE 5: Analyze and Debrief. One of the strengths of peer coaching is that it provides for structured opportunities for reflection that help teachers improve their instruction. The peer coaching program provides coaches with a variety of tools to gather input, debrief participants, and analyze results.

A Peer Coaching Case Study: Northern Arizona Technology Integration Coaching Consortium

The Northern Arizona Technology Integration Coaching Consortium has been providing PD to Arizona school districts to develop and support 90 technology-enhanced model classrooms (TEMC). This project was awarded through the Enhancing Education Through Technology funding from the Arizona Department of Education.

The consortium has implemented two research-based models to promote technology integration throughout the three years of the project: the first, eMints, mentioned earlier in this paper, and the second, the Puget Sound Center's (now Peer-Ed) peer coaching program.

Each LEA in the grant consortium selected the equivalent of one peer coach per school, who attended a weeklong training (five full days) during the summer plus three full-day trainings throughout the school year. Each session provided information, practice, and collaboration with other coaches, feedback, reflection, and planning time in the three core areas of lesson design, coaching skills, and technology integration. These coaches then selected, with assistance from their administrators, one to three collaborating teachers with whom to share their technology integration skills on a regular basis throughout the school year, with a focus on improving student achievement in reading and/or math. This often happened outside the class day, as coaches had teaching responsibilities as well. Coaches helped collaborating teachers plan technology-rich activities, identify resources or strategies for successful implementation, model or team-teach lessons that integrate technology, then reflect and debrief the successes and challenges of the activities.

Ongoing reinforcement from the project facilitators was provided to coaches in every district through both on-site and distance support throughout the school year. In addition, the collaborative community established in the weeklong session was fostered through frequent interaction and sharing of resources on the already-established Puget Sound Center's peer coaching website's discussion forums. This entire process was designed to create and support professional learning communities between and within schools and districts in the consortium.

ISTE's 10 Tips for Leveraging Technology, Coaching, and Community

Where do you begin to develop a transformational learning ecosystem? ISTE offers 10 tips for getting underway in building a transformational PD model inclusive of technology, coaching, and community. Meet with a valued group of stakeholders within your building or school district to see how your current offerings or PD models compare.

- 1. Learning *with* Technology Is More Important Than Learning *about* Technology**
Technology should be used to increase skills and expand or enhance learning across all skills and subject areas.
- 2. Relevance Wins**
Adult learners learn best when knowledge is relevant. Position your program as an opportunity for teachers to improve their craft based upon their own needs and interests.
- 3. Keep Millennials in Mind**
Develop a millennial point of view. Give younger teachers learning opportunities that meet their learning styles: collaborative, online, and technology-driven.
- 4. Relationships Matter**
Allow coaches to build trust one teacher at a time. Your collaborative, technology-rich coaching presence should be perceived as a personal trainer, not an unwelcomed monitor.
- 5. Be Inclusive**
Don't work on your own. Tap into your school or district's PD agenda when developing your technology coaching plan.
- 6. Trust the Process**
Implementation dips are likely to occur, yet sticking with a long-term plan that allows for iterative improvement over time yields stronger results than one-off skill-building events.
- 7. Share Your Progress**
One of the key indicators an administrator uses to determine the success of a PD program is seeing that teachers are actually implementing what they are learning. Having an active communication plan to report progress and successes is crucial.
- 8. Make the Most of Your Time**
Coaching programs are having success regardless of whether they allow for full-time coaches or peer-embedded support with other practicing teachers. Put your best thinking forward in determining a process that will work within budget and time variables.
- 9. Take Technology Mainstream**
Every PD initiative can benefit from the integration of technology. Together, you're better.
- 10. Leverage the World**
Resist the temptation to reinvent the wheel. Use technology, coaching methods, and learning communities as "power partners" to tap into existing resources, experts, and support structures.

Next Steps

Technology is an essential component of 21st-century PD models regardless of the content and pedagogical practice teachers are trying to implement. Just as leveraging technology can help improve learning and assessment, it also can help shift to a model of connected teaching. All types of coaches benefit from weaving technology into both content and practice. The new ISTE NETS·C can enrich professional practice and offer clear support in working with teachers in the areas of Visionary Leadership, Teaching Learning and Assessment, Digital-Age Learning Environments, Professional Learning and Program Evaluation, and Digital Citizenship.

Learn More

Along with adding the NETS·C standards to the ISTE NETS family, ISTE is launching an online Coaching Center—a free PLC that can be found within ISTE Learning. Although the center lives virtually, it promotes a people-centric vs. platform-centric approach to learning. There is no charge to participate in the Coaching Center; you just need to fill out a quick registration to create a free ISTE Learner account. This will allow you to join the public Coaching Center group and get underway!

Take Action

Develop a transformational professional development model inclusive of coaching, a professional learning community, and an embedded strategy for technology integration. This approach provides five key benefits that help prepare teachers to effectively help students prepare to work and live in a globally competitive digital age:

1. **It Solves Teacher/Coach Isolation** by changing the model from a stand-alone school or district to a worldwide environment to exchange ideas, tips, and techniques.
2. **It Builds on In-Context, Embedded Learning** by building a professional program that embraces teachers and helps them to grow exponentially through leveraged learning, exchanging roles, and providing a sustainable support system.
3. **It Lowers Risk** by achieving better results through better practices. Coaches provide help and modeling that show teachers new ways to integrate technology, creating incremental change.
4. **It Provides Greater Modularity and Customization.** The integration of technology, coaching, and communities eliminates the “one size fits all” approach to PD, replacing it with one that shifts and adapts to ongoing personal teaching styles and needs.
5. **It Appeals to Younger Teachers’ Learning Habits.** Coaching appeals to the way that younger teachers learn by using collaboration that allows them to solve problems, develop projects, and model what students need.

Empowering teachers and drawing upon a coaching network can jumpstart a learning community to rally and secure support. A transformational professional development model provides an organic ecosystem for growth. Join us in building power partnerships with technology, coaching, and community to engage not only stakeholders within your school sites but teachers and coaches beyond!

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ISTE NETS for Technology Coaches (NETS●C)

1. Visionary Leadership.

Technology Coaches inspire and participate in the development and implementation of a shared vision for the comprehensive integration of technology to promote excellence and support transformational change throughout the instructional environment. Technology Coaches:

- a. Contribute to the development, communication, and implementation of a shared vision for the comprehensive use of technology to support a digital-age education for all students
- b. Contribute to the planning, development, communication, implementation, and evaluation of technology-infused strategic plans at the district and school levels
- c. Advocate for policies, procedures, programs, and funding strategies to support implementation of the shared vision represented in the school and district technology plans and guidelines
- d. Implement strategies for initiating and sustaining technology innovations and manage the change process in schools and classrooms

2. Teaching, Learning, & Assessments.

Technology Coaches assist teachers in using technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences for all students. Technology Coaches:

- a. Coach teachers in and model design and implementation of technology-enhanced learning experiences addressing content standards and student technology standards
- b. Coach teachers in and model design and implementation of technology-enhanced learning experiences using a variety of research-based, learner-centered instructional strategies and assessment tools to address the diverse needs and interests of all students
- c. Coach teachers in and model engagement of students in local and global interdisciplinary units in which technology helps students assume professional roles, research real-world problems, collaborate with others, and produce products that are meaningful and useful to a wide audience
- d. Coach teachers in and model design and implementation of technology-enhanced learning experiences emphasizing creativity, higher-order thinking skills and processes, and mental habits of mind (e.g., critical thinking, meta-cognition, and self-regulation)
- e. Coach teachers in and model design and implementation of technology-enhanced learning experiences using differentiation, including adjusting content, process, product, and learning environment based upon student readiness levels, learning styles, interests, and personal goals
- f. Coach teachers in and model incorporation of research-based best practices in instructional design when planning technology-enhanced learning experiences
- g. Coach teacher in and model effective use of technology tools and resources to continuously assess student learning and technology literacy by applying a rich variety of formative and summative assessments aligned with content and student technology standards
- h. Coach teachers in and model effective use of technology tools and resources to systematically collect and analyze student achievement data, interpret results, and communicate findings to improve instructional practice and maximize student learning

3. Digital-Age Learning Environments.

Technology coaches create and support effective digital-age learning environments to maximize the learning of all students. Technology Coaches:

- a. Model effective classroom management and collaborative learning strategies to maximize teacher and student use of digital tools and resources and access to technology-rich learning environments
- b. Maintain and manage a variety of digital tools and resources for teacher and student use in technology-rich learning environments

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- c. Coach teachers in and model use of online and blended learning, digital content, and collaborative learning networks to support and extend student learning as well as expand opportunities and choices for online professional development for teachers and administrators
 - d. Select, evaluate, and facilitate the use of adaptive and assistive technologies to support student learning
 - e. Troubleshoot basic software, hardware, and connectivity problems common in digital learning environments
 - f. Collaborate with teachers and administrators to select and evaluate digital tools and resources that enhance teaching and learning and are compatible with the school technology infrastructure
 - g. Use digital communication and collaboration tools to communicate locally and globally with students, parents, peers, and the larger community

4. Professional Development & Program Evaluation.

Technology coaches conduct needs assessments, develop technology-related professional learning programs, and evaluate the impact on instructional practice and student learning. Technology Coaches:

- a. Conduct needs assessments to inform the content and delivery of technology-related professional learning programs that result in a positive impact on student learning
- b. Design, develop, and implement technology-rich professional learning programs that model principles of adult learning and promote digital-age best practices in teaching, learning, and assessment
- c. Evaluate results of professional learning programs to determine the effectiveness on deepening teacher content knowledge, improving teacher pedagogical skills and/or increasing student learning

5. Digital Citizenship.

Technology coaches model and promote digital citizenship. Technology Coaches:

- a. Model and promote strategies for achieving equitable access to digital tools and resources and technology-related best practices for all students and teachers
- b. Model and facilitate safe, healthy, legal, and ethical uses of digital information and technologies
- c. Model and promote diversity, cultural understanding, and global awareness by using digital-age communication and collaboration tools to interact locally and globally with students, peers, parents, and the larger community

6. Content Knowledge and Professional Growth.

Technology coaches demonstrate professional knowledge, skills, and dispositions in content, pedagogical, and technological areas as well as adult learning and leadership and are continuously deepening their knowledge and expertise. Technology Coaches:

- a. Engage in continual learning to deepen content and pedagogical knowledge in technology integration and current and emerging technologies necessary to effectively implement the NETS-S and NETS-T
- b. Engage in continuous learning to deepen professional knowledge, skills, and dispositions in organizational change and leadership, project management, and adult learning to improve professional practice
- c. Regularly evaluate and reflect on their professional practice and dispositions to improve and strengthen their ability to effectively model and facilitate technology-enhanced learning experiences



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For more information about any of the issues mentioned in this white paper, please visit the International Society for Technology in Education (ISTE®) website, call 1.800.336.5191, or e-mail iste@iste.org.

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