One District's Experience: Bringing Professional Development Schools Together Through Technology

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Abstract: Technology plays a significant role in shaping learning opportunities for interns, mentors, and university faculty within our Professional Development School (PDS) network. These opportunities take two forms. First, we explore how we can help interns learn to use technology to support deep, meaningful learning in K-12 classrooms. Second, we use technology to intentionally facilitate a culture of shared learning among our PDS partners. Our goal in this paper is to share how technology enhances collaboration among our PDS partners and the learning of elementary students, preservice teachers, mentor teachers, and university faculty.

KEYWORDS: professional development, Professional Development Schools, school-university partnerships, teacher education, technology integration

NAPDS NINE ESSENTIALS ADDRESSED:
1. A comprehensive mission that is broader in its outreach and scope than the mission of any partner and that furthers the education profession and its responsibility to advance equity within schools and, by potential extension, the broader community;
2. A school–university culture committed to the preparation of future educators that embraces their active engagement in the school community;
3. Ongoing and reciprocal professional development for all participants guided by need;
4. A shared commitment to innovative and reflective practice by all participants; and
8. Work by college/university faculty and P–12 faculty in formal roles across institutional settings

The old adage says, "A picture is worth a thousand words." An update to this for the 21st century might be, "A multimodal digital artifact is worth a thousand pictures." As we all seek to embed more meaningful opportunities for partnership and collaborative learning in our Professional Development School (PDS) networks, technology affords us far-reaching options. Perhaps most importantly, it connects us and makes collaboration possible across settings that were not easily bridged in the past. We can digitally connect preservice teachers with real students and teachers in classrooms (Barnett, 2006) when physical visits are impossible. Mentor teachers in schools can digitally collaborate with university professors, such as those in psychology

or family studies, who may not have traditionally been involved in PDS work. We can connect schools within the PDS network with one another to share expertise and experiences across geographic distances (Theodore & Searcy, 2005). PDS partners—including mentors, preservice teachers, and university faculty—can even collaboratively create resources using online platforms.

Technology also allows us to generate digital artifacts that we can use to share contextually meaningful knowledge. Because we can capture real learning situations in classrooms and keep lesson videos, we are able to produce resources that support job-embedded professional learning. For example, in the past, preservice teachers have analyzed "generic" videos of instruction during their on-campus courses before entering schools, but we now have the ability to create videos that are contextually relevant to their future field placements (Decker, et al., 2014). These videos can also serve mentor teachers and university faculty by allowing us to share instruction that directly addresses local problems of practice. Thus, technology can make professional learning more meaningful, relevant, and applicable to the PDS context (Sutton, 2011).

In our PDS work, we have found two ways in which technology plays a significant role in shaping learning opportunities for all stakeholders. Technology supports meaningful learning in K-12 classrooms and creates a culture of collaboration among interns, mentors, and university faculty. This paper describes how we use technology to enhance our PDS network.

Context: PDS Learning Centers

Recently the Baltimore County Public School System (BCPS) began to concentrate its resources to create six PDS Learning Centers that are designed to accelerate innovation across both K-12 schools and the universities with which it partners. The Learning Centers model builds upon and expands traditional PDS work by promoting professional learning for *all* partnership participants. While our ultimate goal is to enrich children's learning, we recognize that improving adults' learning is an important step toward that end. The Learning Centers provide a site where teacher preparation interns and candidates, veteran K-12 teachers and leaders, and university faculty study teaching and learning through deliberate and critical attention to pedagogy, curriculum, and the cultural context of the participating institutions. All participants share their expertise, with the purpose of improving professional practice.

BCPS is the 27th largest school system in the United States, serving a population of students from very diverse demographic backgrounds: 41% white, 39% black, 8% Hispanic, and 12% other ethnicities, with 49% of the total student population eligible for free and reduced lunch. The largest-growing subsets of the student population in BCPS are (a) students from diverse ethnic groups, (b) English-Language Learners, and (c) students living in poverty. In order to nurture a teaching force ready to educate *all* students, BCPS chose the schools that serve high poverty and/or culturally diverse populations to be PDS Learning Centers. These PDS Learning Centers serve not only as innovative and collaborative teacher preparation communities, but also as hubs to deepen effective PDS partnerships. For example, preservice education majors, mentor teachers, and university professors from other PDS sites routinely visit the Learning Centers to observe instruction and innovative practices.

A steering committee of leaders and practitioners from both BCPS and local universities constructed the core tenets of the Learning Center concept. The tenets serve as the foundation for how we seek to enhance the effective PDS partnerships already in place with a new level of commitment and collaboration focusing on learning for all. The Steering Committee for PDS

Learning Centers agreed to base their six core tenets to extend and emphasize the National Association of Professional Development Schools (NAPDS) and state PDS standards. Therefore, at the core of a Learning Center is the study of teaching and learning wherein:

1. Partners make teaching and learning public through shared, reflective, and systematic inquiry.
2. Partners envision professional development—both at the university and school level—as a set of collaborative and job-embedded processes aimed at enhancing practitioner expertise, developing professional agency, generating new knowledge, and translating new learning into effective and evidence-based practices.
3. Partners honor and develop local expertise by building mutually-respectful and collaborative relationships.
4. Partners collaboratively identify and study challenges in teaching and learning, and actively seek innovative approaches to address them through scholarship, research, and reflective practice.
5. Partners implement their learning in syllabi, curriculum redesign, and engaging pedagogies in both the K-12 and university settings.
6. Partners disseminate new knowledge and insights gained through their collaboration in multiple forums and formats.

Using the *Nine Essentials of a PDS*, these tenets of the Learning Centers are based primarily on essentials 1, 6 and 7 (NAPDS, 2008).

Harnessing both on-site opportunities and technology to share with off-site groups, the Learning Center work supports much cross-subgroup learning among K-12 students, preservice education majors, interns, mentor teachers, and professors. The Learning Centers use technology to share insights and inquiry in a myriad of directions; technology is integrated into the fabric of the Learning Centers.

Learning Center Partners

Our work began in 2014-2015 with a planning year for the first Learning Center partnership. The first partnership was created between one BCPS elementary school and Towson University. This school was carefully chosen by the BCPS leadership because it exemplified a school facing demographic challenges in an urban setting. It was also chosen because it was a "turnaround school" that in five years had progressed from being a school with very low standardized test scores to a school the district began to showcase for its success. Within five years, this school had progressed to the point of being chosen as a "Lighthouse School"—one of ten in BCPS—that would be the first to implement student-centered learning environments, including one-to-one technology in the hands of the students.

The same year that the Lighthouse Schools initiative launched in the district, BCPS began planning to partner with Towson University to develop the first PDS Learning Center. Towson University was invited to participate as the institution of higher education that prepares the largest teacher candidate pool for the district: over 600 new hires each year. In addition, the educational leadership at the university is playing a pivotal role in helping to conceptualize the Learning Center model.

During the formation of the PDS Learning Center concept BCPS also began allocating resources for professional development to support *Students and Teachers Accessing Tomorrow*

(STAT), its instructional initiative that includes student-centered learning and one-to-one technology. The district established a STAT teacher at every school who provides professional development as a coach who has expertise in integrating instructional technology within student-centered learning environments. STAT teachers provide support with the hybrid tablet/laptop device the district purchased to implement its one-to-one initiative. The STAT teachers benefit the PDS Learning Centers because they coordinate job-embedded coaching and follow up to the PDS Learning Center work. This support from schools' STAT teachers ensures that the Learning Centers' efforts are sustainable and scalable.

During the 2015-2016 school year, four other universities began planning for Learning Center collaborations with six BCPS schools. These partnerships include public and private institutes of higher education (IHE), three elementary schools, two middle schools, and one high school. New partnerships are forming each year, as another university and BCPS high school Learning Center just began during the 2016-2017 school year. The partnership projects and activities conducted between each BCPS school and university team are developed based upon the needs identified in each school's progress plan and the strengths and resources each IHE could offer.

Another partner with district-wide connections through the Learning Centers is the Maryland Writing Project (MWP). The MWP, a local site of the National Writing Project, is housed in Towson University's College of Education and serves teachers across the state. As a professional learning community dedicated to building teachers' knowledge, practice, and leadership for writing instruction, MWP embodies many of the Learning Center principles: collaborative, job-embedded PD; professional agency; generating new knowledge and innovative approaches to writing instruction; honoring and developing local expertise; and disseminating new knowledge and insights. Since the partnership began, MWP has sponsored two, two-week summer workshops for Learning Center teachers, as well as after-school workshops in several BCPS schools and district-wide workshops for BCPS reading specialists.

Preparing Interns to Use Technology for Teaching and Learning

The Learning Management System

As part of its STAT initiative, BCPS focuses on technology integration across all aspects of teaching and learning, making this an integral part of the PDS Learning Centers. When elementary students received their own one-to-one devices, it became evident that interns and professors from Towson University needed two things right away: (a) access to the online curriculum and digital content through the BCPS learning management system (LMS) and (b) continuing opportunities for professional development and collaboration with teachers as they grew in their effective implementation of the one-to-one initiative.

One of the first challenges was creating a way for interns and professors to access BCPS One, the digital ecosystem for the school district. BCPS One includes an LMS composed of digital curricula, digital content, and an online gradebook-- critical tools that mentor teachers and interns use to co-plan, co-instruct, and co-assess in order to maximize student learning opportunities. Leadership in the school system's offices of Organizational Development, Curriculum and Instruction, and Information Technology collaborated to design a process that would enable senior year interns to be added as users in the system with all PDS sites in the district.

This allowed mentor teachers to share their classes with their interns and help them learn to use the LMS to support instruction and assessment.

Currently, interns access digital curricula and content in order to plan and differentiate lessons. They also place content onto digital "lesson tiles" to share with students and parents. Interns design and deliver tests and quizzes, enter assessment information, and share assessment data with students and parents under the supervision of their mentor. Through these collaborations, interns learn to leverage technology to customize and personalize instruction because lesson tiles can be designed for individuals, small groups, or the whole class. For example, digital reading materials can be selected and placed on tiles for students according to each student's reading level and interest. These reading materials can then be accompanied by teacher- or district-made videos, visual organizers, assessment tools, or other supplemental activities.

Preparing Interns to Use the School's Learning Management System

The process of preparing interns to use the LMS now begins as soon as an intern's placement in a school is confirmed. A school-based site coordinator holds an orientation for interns and helps them request user credentials from the BCPS Department of Information Technology. Once the interns have BCPS usernames and passwords, the site coordinator sends that information to the Office of Organizational Development on a roster, and the interns are added to BCPS One as users. Mentor teachers are notified when their interns have been added so they can "share" their classes with them and begin coaching them on how to use the LMS to plan, deliver, and assess instruction.

Providing interns access to the LMS has increased co-teaching practices between mentors and their interns. The BCPS Office of Organizational Development distributes a survey to all mentors within the district each semester. On the most recent mentor teacher survey given at the end of the Spring 2016 semester, nearly 90% of all PDS mentor teachers within the district reported that they regularly co-planned and co-taught with their interns. This represents a nearly 30% increase since access to the LMS for interns. The opportunity to co-plan and co-teach extends interns' learning beyond the traditional model in which they designed lessons that their mentors then view and critique. This suggests that access to the LMS has improved the learning opportunities interns experience and prepares them to use LMSs in their future classrooms.

Strengthening Interns' Ability to Integrate Technology

Internship Seminars

Given the prominence of technology in today's schools, a vital role of the PDS is to help interns apply what they learn about instructional technology at the university to real situations in K-12 classrooms. In order to provide just-in-time learning opportunities for these interns, the Towson University site coordinators invited Learning Center mentor teachers to co-teach a number of seminar sessions focused on technology. These after-school sessions address numerous technologies, such as interactive websites, blogs, and curriculum-planning options that the mentor teachers had discovered as they worked to integrate technology into their instruction. These seminars provide opportunities for interns to learn to create technologically rich and appropriate environments for their elementary students. These reflection and collaboration activities allow the

university and the mentors to consider how they can better prepare interns for the realities of curriculum planning and assessment in the one-to-one environment at the Learning Center.

Grade-Level Planning and Professional Development

Learning Centers structure ways for interns, mentor teachers, and university professors to collaboratively explore the possibilities of effective one-to-one technology integration. The first Learning Center had already established a highly effective practice of conducting grade-level planning sessions. The STAT teacher led each session, which included mentors, teachers, interns, and sometimes Towson University professors. During the early stages, these grade-level planning meetings often addressed technology frameworks that would help teachers consider best practices around technology integration. Each planning day was structured around (a) examining school and classroom data as a starting point, (b) introducing an instructional technology concept, and (c) conducting instructional rounds in the classrooms to search for evidence of the concept at work. The latter portion of each day-long session was then devoted to collaborative planning among the teachers, resource staff, and university interns. They work together to design lessons based on what they had learned during the morning's activities. In one of these sessions, the STAT teacher began the year presenting and helping teachers and interns search for effective examples of the SAMR Framework for technology integration (Puentedura, 2006). SAMR stands for "Substitution, Augmentation, Modification, and Redefinition," and it helps teachers and interns design lessons that go far beyond using technology as substitution tasks that have little educational value. For example, teachers and interns at different PDS sites across the district could now conduct conversations with real second graders at their schools by using Skype sessions together. This allows them to describe, show pictures, and ask questions of each other about their respective rural and urban community neighborhoods to make the concepts in the curriculum immediately applicable to their own students' experiences.

At the beginning of the school year, mentors and interns gained a foundation for lesson-planning with the SAMR model. Later in the year, an educational technology professor attended the grade-level meetings and worked in planning teams with teachers and interns. These teams integrated and extended the use of technology to differentiate instruction for all students. Grade-level teams of teachers and interns also worked to identify ways to deepen their use of SAMR to plan ways of redefining instructional activities and learning through the use of technology.

The grade-level planning meetings provide an excellent example of how the Learning Center enhanced learning for all the PDS partners. Mentor teachers and interns learn alongside one another, and the interns' expertise as "digital natives" (Prensky, 2001) in social media and various apps combine with the mentors' expertise in instruction and students' learning needs leading to a better understanding of effective technology integration. In addition, the university professor's expertise in instructional technology supports the interns' and mentors' learning, while also providing a setting where the professor could consider how technology could be used to address the needs of this school and its students.

Instructional Rounds

Opportunities for reflection about the use of instructional technology occur as university professors outside the Learning Center bring their students to examine technology-infused lessons.

Towson University professors brought students in various on-campus classes to the Learning Center for opportunities to conduct instructional rounds. These rounds focus on the rich and technologically-enhanced student learning environments throughout the school. For example, a special education professor brought her class, which was learning about Universal Design for Learning, to talk with the STAT teacher and participate in instructional rounds. They visited classrooms throughout the building and attended a debriefing session afterwards to consider how technology could enhance UDL implementation.

Another professor co-taught an Urban Education class with the BCPS Learning Center Liaison, hosting over half of the class sessions on-site at the Learning Center. The students in the course examined effective technology use and other effective instruction that would engage urban students. This class produced video presentations that included video clips captured at the Learning Center to illustrate the concepts from the course. For the culminating project, students presented how to build a better urban school using video, interviews, and multimedia footage that they captured at the Learning Center.

Using Technology to Share Professional Learning and Expertise

Distance Learning

One of the most exciting uses of technology in the Learning Centers has been designing digital platforms for sharing the learning of interns, mentors, administrators, and university faculty. In some cases, we share knowledge and expertise among the PDS partners, and at other times we share our learning beyond the walls of the Learning Centers. For example, the seminar sessions on technology integration, co-taught by the mentor teachers and the university supervisor at the first Learning Center, were so useful that we decided to offer them through a distance learning format. This enabled interns at more remote sites in neighboring school districts to attend.

Because our first foray into distance learning proved successful, we wanted to provide more opportunities to share our learning with a wider audience. This led us to design longer, more intensive digital learning modules in collaboration with the Maryland Writing Project (MWP). One important aspect of the MWP/Learning Center collaboration is the creation of new knowledge and insights about teaching writing. Teachers who participate in MWP's summer workshops (a) share about the writing instruction they have found effective in their own classrooms, (b) examine research about promising, evidence-based practices for teaching writing, (c) design new, innovative instruction that will meet the needs of students in their schools, and (d) create new curriculum resources to use in the classroom. By the end of the two-week workshop, teachers have generated new ideas about how to teach writing as well as artifacts such as lesson plans, teaching materials, and model texts that can be shown to students as exemplars.

An important goal of both MWP and the Learning Centers is sharing teachers' learning and expertise with other educators. Over its 30 year history, MWP had provided many different opportunities for teachers to disseminate their knowledge, but often, the venues and formats used allowed for only short presentations to a relatively small number of attendees. In light of the Learning Center mission to share knowledge across institutions with as many educators as possible, we wanted to find a more impactful way to share what the teachers had learned during the summer workshop.

In the summer of 2015, teachers who participated in MWP's summer workshop began designing digital learning modules to disseminate the knowledge and insights they gained during the workshop. These modules cover a variety of topics related to writing instruction, such as early childhood writing, multimodal composing, developing classroom writing communities, and teaching reluctant writers. Working in small groups, the MWP teachers use PBworks wikis (available at http://www.pbworks.com) to design 15-hour, online professional development modules for other teachers. Each module combines elements created by the designers (the MWP teachers), such as narrated PowerPoint presentations and videos of instruction made in their own classrooms, as well as "found" resources such as scholarly readings and videos from The Teaching Channel (https://www.teachingchannel.org). The teacher-designers also create interactive elements, including opportunities for written reflections and lesson planning.

For example, the first lesson in the module on Poetry Writing guides participants to write a reflection about their experiences teaching poetry, view a presentation created by the module's teacher-designers, view a publically available TED talk about "why people need poetry" (https://www.ted.com/talks/stephen_burt_why_people_need_poetry?language=en), and read an article about the importance of teaching poetry. During subsequent lessons, participants view examples of classroom instruction through Teaching Channel videos. They also write their own poems that could serve as model texts for their students, and they engage in an author study through a process that could be used in their classrooms. In addition, the teacher-designers include examples of digital poems written by their students and guide participants through the process of composing their own digital poems. The culminating activity engages participants in applying what they have learned by asking them to design lesson plans for teaching poetry writing.

The digital learning modules have proven to be a powerful way to share the learning that occurs through the MWP summer workshop. The teachers develop deep, rich understandings about writing instruction, and their knowledge extends far beyond what might be conveyed in a traditional, two-hour "sit and get" professional development. The digital modules allow the teacher-designers to combine written, visual, and audio elements into multimodal experiences that capture the breadth and depth of their expertise. The length of the modules--five to eight lessons, with each lesson designed to take two to three hours for participants to complete--provides "space" for them to share a significant portion of what they know about teaching writing.

The modules also provide a deep, rich learning experience for the participants who use them. The technology makes it possible for them to see videos of actual classroom instruction, view texts written by real students, read research that they may not have been able to locate on their own, and plan lessons under the guidance of the module designers. Again, the length of the modules allows for a more in-depth learning experience than a more traditional workshop. At the same time, though, because the modules are self-paced and available online, they are more appealing and accessible to many teachers than a face-to-face afterschool or Saturday workshop.

The digital nature of the modules also allows us to disseminate them widely. We are currently working with BCPS's English Language Arts Office to offer the modules to all district teachers as an option for continuing professional development. This is an important step toward making the Learning Centers true centers of learning that contribute to the quality of instruction across the entire district.

Designing the digital learning modules was a time consuming process. The teachers began developing them during MWP's summer workshop, but they did not complete the process until December 2015 or May 2016. To accommodate the time needed to finish this work, we created a

graduate course, offered through Towson University, which focused on designing, testing, and revising the modules. Some teachers registered for the Fall section of the course and completed their work by December, while others opted to register for the Spring section. Teachers in the Spring section wanted to collect work samples and videos of instruction in their classrooms across the entire school year and include these artifacts in their modules.

Websites, Wikis, and Twitter

Because the very foundation of what makes a Learning Center effective is difficult to capture with static words on a page, we have used websites extensively to share our work. The steering committee worked with the professional film crews and editors from The Education Channel, the BCPS internal television network that broadcasts on a local channel. With their expertise, we were able to embed short video clips into an infographic that captures the six tenets of the Learning Center framework in a way that a simple flyer or poster would fail to communicate. To view the framework, go to: https://magic.piktochart.com/output/8075316-the-learning-center#.VhguU8VGg>>P>A.gmail.

The Learning Center also sponsors a wiki of resources that grew out of the Maryland Writing Project (MWP) summer workshop in 2015. The BCPS English Language Arts Office identified a need in secondary schools for professional development around process writing and helping students revise their drafts. We formed a subgroup of middle and high school teachers who had participated in the MWP workshop, and they created and collected a large number of resources to support revision in secondary classrooms. For example, they designed "revision stations" that allow students to engage in multiple revisions of a draft. Each station guides students through a series of collaborative activities that teach them how to revise one aspect of their compositions, such as sentence variety, descriptive language, dialogue, introductions, and conclusions. Upon completing a station, each student then revises their draft using the strategies they learned at the station. The wiki includes directions for teachers about how to implement each revision station as well as all the student materials needed to engage in the stations' activities.

As with the digital learning modules, the wiki proved an extremely valuable platform for teachers to share their learning, enhance other teachers' learning, and, ultimately, provide deeper learning opportunities for students. The wiki designers offer professional development to schools across the district and share the wiki resources. These digitally-housed materials make it possible to upscale the effective instruction that the teachers had designed during the MWP summer workshop.

Another Learning Center created a website in partnership with the Maryland Writing Project (MWP). In light of the time-consuming nature of designing digital modules during Summer, Fall, and Spring of 2015-2016, we looked for a different way to disseminate the learning of teachers who attended MWP's summer workshop in 2016. Rather than designing learning experiences for other teachers, Summer 2016 participants created curriculum resources, including lesson plans, unit outlines, examples of teaching materials, and explanations of how to set up a writing workshop in the classroom. To disseminate this work, the teachers created a website using Weebly.com. Like the learning modules, the website allows teachers to share their learning multimodally and include visual, textual, and audio components. The site is also readily accessible to teachers within BCPS. Furthermore, during the entire Maryland Writing Project workshop, we used Twitter as a social media vehicle to spread the word about our efforts and engender interest

from the greater educational community. Thus, the Learning Center once again shared its knowledge and learning beyond its own walls.

Video Applications

The use of video technology is also transforming the ways that interns learn to teach, how university faculty prepare interns for the classroom, and ways that mentor teachers can give interns feedback. Towson University's College of Education has begun implementing a "clinical" curriculum (Grossman, Hammerness, & McDonald, 2009) in which preservice teachers learn, and then extensively rehearse, good "high leverage practice" (Teaching Works, 2016). This curriculum requires interns to video their teaching, analyze it, receive feedback about it from their peers and university professors, and then improve their teaching based on the feedback. We are currently using Swivl, a cloud-based service that allows interns to upload and share a video of their teaching and then receive written feedback that points to specific sections of the video. For example, when an intern clicks on a comment, the video jumps to the point in the video where the viewer made the comment. This allows interns to connect specific feedback with specific points in the lesson.

Although we are currently piloting the clinical curriculum and Swivl platform only at the university, this technology offers the possibility that a Learning Center's members could share their expertise with interns who are not in field placements there. Using the online platform, mentor teachers could view the teaching of interns who are still in campus-based courses and provide feedback about their teaching. Preservice teachers would benefit from the feedback of practicing teachers in addition to the comments provided by their university professors. However, mentors would also benefit from seeing how interns early in the program (pre-internship) gain teaching skill. This would help mentors to better understand the developmental progression of "becoming a teacher" and could inform and enhance their abilities to give feedback to interns at later points in the program.

While we have used distance learning technologies, websites, wikis, Twitter, and Swivl as ways to share learning and expertise, we see further opportunities to explore other technologies. Google Hangouts, Skype, and other interactive media are ripe with possibilities to support distance learning. In our future work, we plan to investigate how technology can help us connect with an even wider array of educators to share knowledge and improve learning for all K-12 students, interns, mentors, and university faculty.

Final Thoughts

Technology enables us to create a rich collaborative context within the Learning Centers and beyond. We use technology not just for the sake of using it, but to further the Learning Center goals in substantive ways. As we seek to make teaching and learning public, develop and honor local expertise, disseminate new knowledge and insights, and create a collaborative learning environment for interns, mentors, and university faculty—all goals of the Learning Centers—we see technology as crucial to our efforts. We have learned that we must select technology for specific outcomes that will further the learning of the various stakeholders within the school-university partnership. The students at the PDS site are ultimately the most important stakeholders,

and the thoughtful use of technology allows the adult activity and learning that surrounds students to contribute to their success as learners.

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