[1]Three Days in March: Examining the Adaptive Expertise of a Teacher Leader at a Crucial Moment in a School-Embedded Teacher Preparation Program

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Using an adaptive expertise lens, the following case study examined a teacher leader's perceptions of three crucial days in his life and practice. From March 13th to 16th, 2020, when his school responded to the COVID-19 virus, David1, a teacher leader, had to move a complex school-university learning partnership from in-person classes to an on-line environment. In the partnership, a graduate-level preservice teacher preparation program was embedded into the daily operation of an innovative project-based middle-school. In this partnership, David wore four hats: he taught 6th grade classes, taught a graduate-level technology course at the middle school in the teacher preparation program, co-directed the school university partnership, and conducted professional development for his school and district. In the midst of a rapidly changing global crisis, David had to coordinate changes to each of these four interconnected institutional levels (of which we study the first three). The following research question guided the study: What were the key factors that facilitated David's leadership for teacher preparation and partnership success? Three key findings emerged from the research as important contextual pieces that enabled David's adaptive expertise as a teacher-leader —and which allowed the school-university partnership to continue for the full semester: (1) David's deep knowledge of educational technology; (2) his ability to respond to challenges by drawing on foundational beliefs and principles; and (3) the progressive leadership of administrators at multiple levels

Keywords: COVID in education, adaptive expertise, project-based learning, teacher preparation, and embedded teacher preparation[2]

[1] Pseudonyms were used for all formal-and-place names.

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Introduction

Educational leaders have long extolled the benefits of practitioner embedded teacher preparation (PETE). For example, in 1985 Sharon Feiman-Nemser and Margaret Buchmann called for closing the "two-worlds pitfall" between college-based theory and school- based practice. The following year, the Holmes Partnership (1986) advocated creating career ladders to include teachers in clinical practice around teacher preparation. And, in 2010, NCATE released their Report of the Blue Ribbon Panel (NCATE, 2010), in which they called for integrating practitioner knowledge, decision making, and activity in all stages of teacher preparation. Describing the benefits of intertwining theory and practice and university and school expertise as a helix, Feiman-Nemser and Buchmann stated (again, almost forty years ago):

> Overcoming the two-worlds pitfall requires acknowledging that the worlds of thought and action are legitimately different. Each has its unifying purposes and a potential for making a contribution to learning to teach. In other words, one does not overcome this duality by eliminating it. The goal of professional education is acting with understanding. Neither understanding nor action will suffice by itself, and belief alone does not produce action. (1985, p. 64)

Jumping forward a number of decades, in 2018 a small university in Washington state formed a partnership with an innovative local school district to embed their masters' level secondary teacher preparation program into the complex practice of the district. Working together, their goals in planning and establishing this partnership were first to close the gap between theory and practice in teacher preparation: instead of learning about theory separate from real-world student learning, they structured a program in which the teacher candidates' could learn how theory and practice together inform, add depth to, and animate each other—when actively combined by the candidates. Second, they sought to scaffold the teaching candidates' inquiry and practice, knowledge, and skills, providing them with a complex lens with which to view teaching and learning. As part of the second goal the university and district developers of the partnership structured the experience as a laboratory of learning, not just for the candidates, but also for themselves.

In this paper, we examine the following research question from the perspective of the teacher leader (TL) with the partnership district: What were the key factors that facilitated David's leadership for teacher preparation and partnership success? The teacher leader we studied wore a number of hats: he taught middle school at the partnership school, taught the technology course for the university (at the partnership school), was a professional developer for the district, and was one of the two directors of the school-university partnership. Significantly, the time period we focus on in our study was the beginning of 2020—the initial year that schools shifted to online teaching due to the COVID crisis. Literally, over one weekend, this teacher leader shifted from coordinating a complex partnership embedded in a glass-and-mortar school to one existing in a cyber environment. This change involved the working relationship for the middle school students, the teacher preparation candidates, and the school-university partnership.

With this paper, we seek to contribute to a central consideration of PETE—core practitioners' decision making both descriptively (what were quick high-stakes decisions) and analytically (why did they make these decisions and what supported and/or hindered them)? For our conceptual framework, we draw from literature on adaptive expertise.

Adaptive Expertise

Teachers who are adaptive experts "are prepared for effective lifelong learning that allows them continuously to add to their knowledge and skills" (Bransford, Darling-Hammond, & LePage, 2005, p. 2). Teachers' views of diverse student learning are central to their process of developing adaptive expertise as they begin to challenge their own specific ways of learning and understanding. Personal and professional dimensions of teachers' work interact to facilitate a change in beliefs and values and practice (Corno, 2008; Randi & Corno, 2005).

There may be general patterns but no set template for the development of adaptive expertise. Personal factors such as teachers' views of student diversity, academic content knowledge, ethics, and student learning interact with contextual factors such as the school setting, opportunities and patterns of collaboration, and administrative support to facilitate or hinder teachers' growth of adaptive expertise (Darling-Hammond & Bransford, 2005). Adaptive expertise is distinguished from routine expertise by knowledge representation, cognitive and analogical problem-solving abilities, and past experiences (Carbonell et al., 2014). In contrast to adaptive expertise, the concept of "routine expertise" suggests an over-reliance on specific teaching routines and patterns. While teachers may find success with these routines in some settings, their use becomes problematic when they encounter diversity in student learning and the environment.

Furthermore, one's adaptation to a change of some sort (in task, demands, environment) distinguishes adaptive expertise. Environment both facilitates and indicates adaptive expertise. In a ten-year longitudinal study of teachers' changing narratives of practice, Zumwalt et al., (2018) found that teachers began to acquire adaptive expertise when they encountered and experimented with solutions to new and challenging classroom environments (e.g., teaching students very different from their views of themselves as students), indicating that both individual and environmental factors played a role in their development of adaptive expertise (Carbonell et al., 2014; Zumwalt et al., 2018).

In our study, we referenced three characteristics of research on adaptive expertise (Carbonell et al., (2014):

> Firstly, studied tasks need not be standardized nor representative for the domain; however, they need to represent a realistic problem. Secondly, participants are not selected for their track record of superior performance in their domain, but they should also not be novices. Ideally, they have some years of work experience. Thirdly, performance should be measured based on speed, accuracy and feasibility of proposed solutions to unfamiliar problems. (Carbonell et al., 2014, p. 16)

The educator we examined in this study met the three above criteria. He addressed the need for a large-scale program (and partnership) revision due to a public health emergency—an exceptionally realistic and pressing problem. He was a teacher leader, grounded within classroom complexities and challenges. And, given the urgency of the problem and its many potential contingencies, his "speed, accuracy, and feasibility" within the adaptation were central considerations.

Methods

Again, the initial research question that we examined was the following: What were the key factors that facilitated David's leadership for teacher preparation and partnership success? To explore the research question in depth, we developed an intrinsic case study design (Stake, 2003). This design was selected on account of the researchers' interest in gaining a deeper understanding of a single case not for its generalizability to other cases, but because "in all its particularity *and* ordinariness, the case itself is of interest" (Stake, 2003, p. 136, original emphasis). As such, we conducted a two-hour interview with David, a media specialist and teacher-leader who was instrumental in maintaining the integrity of the school-university partnership throughout the initial surge of COVID-19 in the US in March 2020. Additionally, we collected and analyzed artifacts generated by David and the university students over the course of the Spring 2020 semester. Finally, we analyzed the concurrent notes taken by Lewis, the university coordinator of the partnership. These notes included planning documents and memos on the collaboration that took place among Lewis's Improvement of Instruction class and David's Integrating Technology into Classroom Teaching and David's sixth grade students at Otis Middle School.

Study Context

The study took place in an affluent community of approximately 26,000 people in southwest Washington, twenty miles from downtown Portland, Oregon. The idea for Otis Middle School (OMS) and its adjacent Project High School (PHS) was borne of a year-long community outreach effort within the town to determine the type of school residents were most interested in building, and what kinds of programs the community felt it needed. As David informed us, "[t]he one thing that kept coming back was parents wanting something that really had deeper learning experiences and learning that went beyond the traditional classroom." As such, OMS opened to sixth and seventh graders in 2016 and PHS opened to 9th graders in 2018 with an explicit focus on project-based learning, a pedagogical approach based on the notion that students learn most effectively when actively engaged in real-world projects, ideally ones that students themselves design (PBLWorks, n.d.).

The partnership between OMS/PHS and the MIT Secondary Program at Washington State University Vancouver itself began in 2018 after David and Lewis were introduced at a community outreach event hosted by the superintendent Dr. John Greene and OMS/PHS principal Ethan Jones with the purpose of connecting community partners with school leaders and faculty.

After the outreach event, Lewis recommended bringing the MITS preservice teachers (PSTs) to observe classes at OMS and PHS. The single-day observation initially planned blossomed through conversations about the overlap between the concurrent courses the PSTs were taking in which they explored principles of instructional design and educational theory in Lewis's course, alongside educational technology pedagogy in David's course.

In the first-year of the partnership, following a full integration of David's and Lewis's classes with the field in 2019, David and Lewis began teaching their courses in the new high school building, adjacent to OMC. PSTs were designing and carrying out "Maker Mondays"--a series of workshop-based classes organized around a topic of interest to the students--with David's sixth grade students. The term "Maker Monday" reflected the day of the week the PSTs visited the school and the constructive nature of the project–that it was a creative, maker space.

A goal was for the PSTs to begin to study and engage theory and practice as a living dynamic. In his course, Lewis focused on art, curriculum making, differentiation, self-regulated learning, formative assessment, and interdisciplinary and project-based unit planning. David in turn focused on using technology as a learning tool for the PSTs as they worked through a number of design and teaching steps within project-based learning. Student motivation, inquiry, and voice lie at the heart of project-based learning. Facilitated by teachers, who guide and scaffold students' work to promote their learning interdisciplinary content and skills, PBL unfolds with somewhat recursive and overlapping steps: teachers need to consider the learning context and work with students to generate an idea and then a framework for a project. The last step includes their (teachers and students) setting learning goals, selecting major products, deciding how products will be made public, and writing a driving question.

Following an outline organized around a specific format (a modular planning form), they gave an overview and calendar of their projects and engaged in detailed pre-planning. As part of the preplanning, they considered their project launch, formulated essential questions, brainstormed student learning scaffolds around the questions, collaboratively critiqued their plans, drafted and revised their plans, integrated formative assessment into their plans, integrated structures supporting their own reflection into their plans, and then planned their students' formal exhibitions of learning.

In the first year—one year before the pandemic shutdown in-person classes—PSTs worked in disciplinary groups (math, science, English/language arts, and history/social studies). They designed and collaboratively taught their units to 9th grade school students in different classrooms at the high school over about a one-month period. (While David taught 6th grade classes, the PSTs taught their projects in adjacent classrooms at the high school.) Their topics included the Flint Michigan Water Crisis, Eco-justice and Trash Maps, the Dust Bowl and Great Depression, A Community Food Drive, Exploring Earth and Space—How to Be Environmentally Friendly, and an Eco-Poetry Workshop. In that first year, PSTs mentioned that they benefited greatly from the partnership but in some cases resisted changing a traditional stance toward teaching and were challenged by the teaching situation, specifically by large class sizes and initial problems with an internet interface.

In the spring of 2020, a new university cohort of only seven students entered the program, which meant that the PSTs could work directly with one class of OMS sixth graders during a STEM elective, one in which the goal was to expose students to tools and technologies that could enhance their approaches to project-based learning. With this cohort, David and Lewis changed the format for the program. David decided that the PSTs would all teach their units in his middle school classroom, with the focus of the units initially being a community garden. The plan was for them to design weekly segments and then teach the introductory part on a Monday, with David then completing the teaching over the four days. Lewis and David hoped that this change would shift much of the teaching pressure and responsibility from the PSTs to David, providing them with a greater opportunity to reflect on their experience.

Unfortunately, after planning their modules and preparing to teach them, on Friday, March 13th, the Governor of Washington replaced in-person classrooms with virtual classrooms. Over a two-day period, David and Lewis (with David taking the lead) changed the program, including the PSTs' teaching experience and the embedded courses organized around that experience. With the preservice teachers, David devised a new pedagogical question on March 16th, when they met again: "How do we scaffold opportunities for our students (the middle/high school students) to find and build community in our teaching during the unfolding pandemic"?

Over the next month-and-a-half, everyone in the partnership focused on the new question. Using the same design module from before the pandemic, the PSTs designed and—now using online tools--had the middle school students work toward constructing curriculum around the new question. The middle school students developed the following projects: designing PPE gear (personal protective equipment), planning a fitness school (that is, the middle school students designed the school), and creating a historically grounded resource bank of examples of empathy and reflection during the crisis. In the last unit, the PSTs had their young students go back and research their own work and learning, highlighting examples of where they themselves found hope and wellness, and building on a goal of project-based learning as an opportunity to understand and engage in self-directed learning.

Participants

David, a white, gay, 15-year veteran teacher, media specialist, and teacher leader is the focal participant of this study. An alumnus of the elementary/middle school MIT program at the same university with which he would later collaborate, David was highly influenced by project-based approaches to instruction, and was among the founding faculty of Otis Middle School in 2016. During the time of the study, he served in a dual capacity as both an educational technology instructor for OMS and a media specialist for the adjoining PHS, also a project-based learning institution.

Lewis, a white, 30-year veteran teacher, who also identifies as gay, designed and has coordinated the MITS Program on his campus for 22 years. An advocate of teacher leadership and teacher professionalism, he has worked in a number of school-university partnerships. He is especially interested in participatory approaches in education.

Finally, there were seven PSTs placed at this school at the time of the study. The academic disciplines of these teacher candidates were secondary science, English/Language Arts, and history/social studies. With the exception of the sole history intern, who was a white male, all the interns were women, with two of them being women of color. All of the interns had a strong social justice orientation and believed in student agency and voice.

Data Collection and Analysis

In order to ensure a level of objectivity to the study, Jessica, the second author to the study and a researcher at the university but not a member of the partnership, took part in the data collection and conducted the data analysis and write up.

To explore our central research question, *What were the key factors that facilitated David's leadership for teacher preparation and partnership's success?*, we collected data from three main sources: first, a transcript generated from a two-hour interview with David, our focal participant; second, artifacts related to the OMS/PHS partnership including the materials David created in planning the course and in the pivot towards virtual instruction that occurred at the onset of the COVID-19 pandemic in March 2020; and finally, Lewis's notes, memos, and planning documents generated before and over the course of the Spring 2020 semester. These data sources were thoughtfully selected with regard to our central research question. As David played the largest role in re-designing the partnership after schools in the district shut down, his perspectives and experiences form the bulk of data in this analysis. Further, our rationale for collecting and analyzing the artifacts created by both David and Lewis stems from the ethnographic view that these are all "social products," which include not only tangible documents and texts but also the environments and spaces (physical and digital) in which we

exist (Hammersley & Atkinson, 2007). Taken together, the variety of data sources contributes to the validity of our analysis (Merriam, 2009).

With our collected data in tow, Jessica took the lead with a first round of initial coding involving "meticulous analytic attention by applying specific types of codes to data through a series of cumulative coding cycles that ultimately lead to the development of a theory—a theory 'grounded' or rooted in the original data themselves" (Saldaña, 2013, p. 51). These types of codes were determined by the data themselves: that is, predetermined codes were not applied to the corpus but instead were generated initial codes from the corpus itself. As such, initial codes generated included "challenges"; "reflection"; and "administrative leadership." At the conclusion of this initial coding, Jessica drafted an analytic memo which sought to draw out salient themes and connections among the corpus. Then, she conducted a round of focused coding of the entire corpus, including the newly-generated analytic memo. This focused coding was centered on the research question, and codes created during this round included "technology as a tool," "guiding principles," and "available resources." Finally, she drafted an integrative memo which combined data-driven themes with an articulation of the dimensions of the emergent findings, generating a grounded theory based on the data. In order to achieve reliability, Jessica shared developing codes and memos with the research team to garner their feedback. She also conducted member checks with David and Lewis, allowing them to confirm and fine-tune the themes. We share and discuss these findings in the following section.

Findings

In response to our central research question, our analysis uncovered three key factors that facilitated the partnership's success in the Spring of 2020 even as COVID-19 ground many facets of life to a halt. Specifically, we identified David's deep knowledge of educational technology, his ability to respond to challenges by drawing on foundational beliefs and principles, and the progressive leadership of administrators at multiple levels as important contextual pieces that enabled David's adaptive expertise as a teacher-leader to shine—and which allowed the school-university partnership to continue for the full semester.

Key Factor 1: Adaptive Expertise Proffered by Foundational Knowledge of Educational Technology

David's Foundational knowledge offered him a reservoir of knowledge. This knowledge existed both before and during the crisis.

Pre-Crisis "Existing" Foundational Knowledge

Undoubtedly, a key component of David's successful teacher-leadership during the spring 2020 semester was his thorough, flexible understanding of and approach to educational technology, and the great wealth of prior knowledge of educational technology he possessed. A technology teacher for 15+ years, in addition to serving as a media specialist, David was well-versed in the technological offerings of both his district and Otis Middle School, itself an institution with considerable access to cutting-edge hardware and software. For David, however, technology is viewed as a means, rather than end in itself. Describing his approach to educational technology, David explained,

> Here is a question of interest to us: let's go out and explore that topic through research. Let's design solutions to the problem we've identified, or find ways to make this project enhance our school community, and while we do that, let's learn about how to use technology in our projects.

To ensure the PSTs could fully immerse themselves in the planning and teaching of the sixth grade educational technology course, David advocated for their access to all on-site technology, including the design lab, the 3D printer workspace, and even school-affiliated Google accounts. This access facilitated PSTs' understanding of the real-life contexts in which their sixth graders were learning. As opposed to taking an ed tech class in a computer lab on a university campus—as was the case for David when he was completing his master's degree—David's focus from the start of the university partnership was one marked by a fully-integrated experience at OMS. This focus of integration preceded and continued through the pandemic.

David's university class was organized around four educational technology "milestones." The first involved getting students accustomed to a variety of technology, and facilitating an understanding that technology is constantly changing. David was careful to point out to the PSTs that he "can't teach them educational technology," as the technology in their future classrooms will likely be different based not only on location, but also on the fact that technology is emergent, and new updates, products, and applications will necessarily be in play wherever they end up, and throughout their careers. This flexibility and fluidity with regard to understanding the nature of educational technology provided the foundation upon which the successive milestones built. To this end, David described the second milestone: "In the classroom, how can we work together to design a project-based learning unit that then applies what we know about technology, that gives us the opportunity to practice teaching within a very safe environment where failure is okay, where you can quickly see what works and doesn't work?" In sum, this milestone found PSTs actually creating an integrated PBL unit and collaboratively using technology to plan that unit. The third milestone required students to carry out the PBL unit they had devised during the second milestone. Finally, the fourth milestone involved creating a portfolio that exhibits deep reflection about the PST's experiences, what they learned from these experiences, and, in David's words, "what do we take forward?"

Foundational Knowledge and the Crisis

The COVID-19 shutdown occurred just as David and the preservice teachers had concluded their planning as part of the second milestone, which necessitated a shift from the initially-planned PBL project of a school garden to tasking PSTS with creating five weekly, asynchronous modules appropriate for sixth grade students. David's technological expertise facilitated this abrupt pivot; impressively, he built out an entire Google site over the weekend of March 13-15, one that was ready to unveil to the PSTs by Monday, March 16, the first day of remote instruction that semester. This Google site provided for the PSTs a central hub for all information, projects, and assignments for the remainder of the semester. Additionally, David adapted the syllabus to include readings on PBL in remote environments, and introduced a new essential question for the course: *How do we leverage the current trends, educational pedagogy, and modern educational technology as tools to provide meaningful and equitable distance learning for all our learners?*

In these ways, David's unique expertise with educational technology, an expertise that embraced flexibility, approached technology as a tool in service of learning, and leveraged available resources in providing high-quality remote instruction, positioned him to be able to adapt the school-university partnership to an online environment over the course of a single weekend.

Key Factor 2: Overcoming Challenges through Adherence to Guiding Principles and Mindsets

Though David was uniquely suited to meet the immediate demands of the COVID-19 shutdown, the challenges posed by the pandemic with regard to public education were, as elsewhere, myriad. However, David's adaptive expertise also extended to his personal pedagogical beliefs, and a core belief in the importance of authenticity in education allowed him to overcome these challenges. Authentic learning was a guiding principle of OMS, and was generally defined as learning experience that held value to the learner. This intersubjective approach, whereby the students themselves were the ultimate evaluator of authenticity, ensured that their voices would be centered in all educational decision-making.

For David, this principle of authenticity extended to his work with PSTs and was indeed the impetus for the school-university partnership in the first place. After the onset of COVID-19, David sought to structure the course in a manner true to the value of authenticity, avoiding anything that felt "forced," and ultimately seeking to give "our graduate students a chance to lend their own voice, experiences, and interests to a class of sixth graders." In this spirit, the first university course after the COVID-19 shutdown found David and the PSTs collaborating in an ideation session via Google Jamboard. Here, they brainstormed responses to David's essential question, *How do we leverage the current trends, educational pedagogy, and modern educational technology as tools to provide meaningful and equitable distance learning for all our learners?*, and worked in small, content-area groups to come up with an essential question for a week-long module that could be explored via remote instruction. As David explained to the PSTs,

> We're going to be throwing out all those plans that you made, we're going to be recasting them and we're going to be creating online modules for asynchronous learning to help students understand what is happening in the world around them in relation to this pandemic.

David designed the first weekly module as a model for the PSTs, one based around the essential question, "How can I find community in difficult times?" Thereafter, the PST cohort planned weekly modules for the remainder of the semester, five in total. These modules, following David's lead and hewing closely to themes of authenticity, asked sixth graders to engage in activities like documenting the pandemic's effects on their community, designing personal protective equipment, and setting and maintaining mental and physical health goals.

In addition to David's principle of authenticity in educational experiences, a key mindset that contributed to his ability to carry out a successful school-university partnership during the initial surge of COVID-19 was that of (in his words), "Yes, and." Whenever he encountered roadblocks and obstacles during the Spring 2020 semester, David was assured in his ability to "come up with another solution. We can find another way to get that same experience to happen." He viewed the PSTs and his sixth graders alike as resources themselves, and engaged

them all in a positive spirit of exploration. Further, this "can do" mindset allowed him to leverage the shift in the pedagogical paradigm that had started to take place earlier in the semester—in which he and Lewis together worked to expand students' initial views of themselves as "history" or "science" teachers to also include project-based learning—to then shift further into virtual pedagogy. These multiple shifts, ones the PSTs maneuvered seamlessly in large part owing to David's leadership, are all part of the work of teaching and leading in David's view:

> That's what teaching is…I was taught my first year that if I was teaching the exact same way, every year, then I really wasn't growing as a teacher… I have been teaching for 14 years, always with this idea that each year is a re-creation and an opportunity to improve, and so I try to.

Indeed, David's treatment of the COVID-19 shutdown as a prime opportunity for authentic, project-based learning is evidence of the power of his core belief in authenticity and his "yes, and" mindset to overcome the instructional difficulties presented by the pandemic. Contrasting his colleagues' anxiety at the start of the pandemic with his own optimism, David said, "I was like, this is no problem. You know, this felt natural to me. This was a transition in some ways that probably played to my strengths as a teacher." In this way, David highlights a strong connection between adaptive expertise and teacher beliefs, principles, and use of foundational skills.

Key Factor 3: Necessity of Responsive Leadership at All Levels

A final factor in David's ability to skillfully navigate the COVID-19 school shutdown and continue the school-university partnership was the prior existence of supportive, responsive leadership from various stakeholders. At the school level, both OMS and PHS were led by administrators who were fully invested in project-based learning, and as a result, were open to David's pedagogical innovations both before the pandemic and throughout it. Moreover, the deep, well-maintained relationships among Dr. S, the district superintendent, Mr. S, the principal of both OMS and PHS, and the District School Board underscored the investment of all parties in the continuation of the school-university partnership after in-person learning had stopped. "We had district leadership behind us from the superintendent down," David explained.

Once schools in the district shut down, David was tapped to provide a week of training for district teachers on the basics of educational technology so that everyone had a baseline, working knowledge of Zoom, Google sites, and online module-building, among other skills. Meanwhile, the school district itself made a pivotal move away from a strict focus on standards-based instruction and grading. As David noted, "All of that just disappeared. In our district, really our goal was to connect with students. We weren't there to grade, we were there to keep our students connected, to keep them engaged with learning, to give them support the best we could." The district's consistent messaging of kids and connection before content was additionally freeing to David:

> [The district's] goal was to let [students] have learning experiences [knowing] that there would be lost learning, and that we're not going to hit everything that we taught before. And for the first time in my teaching career, that was a relief to hear, because as teachers it's easy each year to say I did that before, and now I'm going to do this, and never let go of anything along the way. A lot of things got to be let go of, and focus really went back to things that were important to me.

As such, the district and school leadership pieces, ones that focused on attending to students' diverse, social emotional needs--and ones unique to the socioeconomically- and racially-privileged setting of OMS--further bolstered David's sense of agency in his own leadership, which he lent not only to his sixth-grade students, but also to his faculty colleagues and to the university PSTs.

David's adaptive expertise as a teacher-leader was also utilized within the school-university partnership, where Lewis's flexible and open leadership meant that David could step in after the onset of COVID-19 and freely innovate a plan for the rest of the semester. Lewis, as the MITS program chair, had previously worked to develop a program focused on self-regulated learning and curriculum-building, which were already well-accounted for in the joint syllabi Lewis and David had planned for the spring semester. These building blocks proved fortuitous for what was to come, as PSTs were in the early months of 2020 already engaging in conversations about the need to adapt teaching instruction to meet the needs of learners. An early photovoice project in which PSTs were asked to take and share a photo that in their minds connected to the concept of curriculum (and took turns interpreting one another's photos) also provided an early opportunity for students to engage with the embodied and narrative aspects of curriculum. With this early exposure to educational theories and their practical applications in the classroom, the PSTs were primed to rethink and recalibrate their concepts of teaching and learning after the onset of the pandemic. Finally, the PSTs were supported in their continuing partnership by not only David, but by an entire school district that made the choice to forego a myopic focus on content learning to also include K-12 students' well-being and mental health. These factors were critical to David's ability—and the PSTs eagerness—to keep the partnership going for the rest of the spring 2020 semester.

Discussion

Our context of analysis, an embedded teacher preparation program in a middle school at a crucial time during a pandemic, provided us with a unique opportunity to examine the adaptive expertise of a teacher leader. David's demonstration of adaptive expertise suggests that, before the crisis hit, he had already developed the capacity to understand and make nearly immediate multi-level adaptations within an unstable and unfolding situation. Although his experience at this school no doubt allowed him to add to his knowledge and skills, he had already reflected deeply about the partnership project and curriculum as a laboratory of practice and made significant changes to the second iteration of the program in 2020. Again, demonstrated by the changes he had made in the program, he entered the crisis with an already heightened analytical and flexible stance.

The demands of the crisis—working with students undergoing possible trauma and social emotional distress, understanding the dimensions of the problem and then planning to reestablish an educative environment, and then having the pedagogical skills and tools to actually enact the

desired changes—all these aspects of the crisis framed his use of adaptive expertise. Fortunately, the demands of the crisis were consistent with the skills and knowledge he had developed within his previous relational approach to teaching and learning within project-based learning. The planning and teaching framework that David used and adapted from project-based learning provided him with the structural means to continue his work. Furthermore, he created a bridge to the new teaching environment with his knowledge of teaching with technology (as tools for student learning). The guiding question he used with the revised curriculum—how to facilitate meaningful and equitable distance learning for the middle school's students --was grounded in the social and learning principles of his school district and was consistent with his values and beliefs for education. Finally, the emphasis of the partnership as a laboratory of learning gave him (and others) involved in the project an explicit, multi-leveled context for reflection and continuous learning.

In this study, we found that three interconnected dynamics were at play in this process. First, as David acknowledged his students' social-emotional distress and their need for a sense of place, security and even agency at a time of immense displacement, he tapped into deeper human sources of meaning making and teaching and learning. With this stance in the foreground, he was able to view the different online programs and even the framework for project-based learning as tools in building educational community. His knowledge and expertise in the use of technology and project-based learning were extremely important, but without his humanistic stance, he would have applied them in different ways.

Second, David's professional knowledge mattered. He structured a dynamic in which students' social well-being became a part of curriculum. Applying his theoretical and practical knowledge of the use of technology to the situation, David created a space to give his students voice, to allow them to animate the curriculum. Working within the demands of the crisis, he was able to benefit the middle school students as he scaffolded the learning and expertise of the PSTs.

Related to his knowledge, as previously mentioned, he stated that "this felt natural to me […, and] probably played to my strengths as a teacher." While the demands of the crisis may have played to his strengths—including those related to the use of technology--as an educator, those strengths had been (fortunately) nourished and supported by his school. A question for which we don't have data is the extent to which technology knowledge was fairly broadly distributed among faculty at ODM/PHS or came to be more situated within David as the technology expert.

It should be noted that this generative learning context was reflected in the authentic work of the PSTs as they designed curriculum around the central guiding question. But it was also reflected in the work of the middle school students as they created a more positive environment around themselves in their homes and communities.

Finally, David applied his knowledge about adult learning and professional development within institutions. He leveraged the support of his principal and district superintendent, as well as his university partners, to facilitate the learning and development of his graduate students and school colleagues as he engaged in professional development efforts. Although the original plan of having the PSTs share their knowledge with the entire school community as an exhibition of their learning was cancelled, he continued to work with other teachers. Throughout this process, he emphasized the human dimension of change:

> The metaphor for our class […] is that every educator can create ripples of change. The single experience […] and personalized learning on our campus could impact the practice of the students in my course; they can impact other educators in the region and the regional educators can impact learning and their systems as well.

Although we can't comment on the ripples of change beyond the boundaries of our study, we can assert that within the partnership and the teacher preparation program, David generated a tsunami of change.

Given the value of this change, we turn now to the question of how to facilitate teacher leadership and adaptive expertise. In terms of preparing new teachers to exhibit adaptive expertise, this study suggests the value of PETE, practitioner embedded teacher preparation. As we have tried to show, adaptive expertise takes place in situ. It is specific, situated, grounded, and dynamic: formal-and more-grounded theory intertwines with craft knowledge within practice. Based on our findings, practitioners can clarify their practices and strategies by constructing laboratories of learning. So, while the teaching interns were constructing projects for and with their students, they could also have been examining their experience as a larger-project. Key to this process is making the invisible, visible and establishing clear structures—such as promoting communication, identifying and sharing problems, and providing shared planning time—that create relational ways of learning.

We suggest that the partnership itself might also become a laboratory of practice, in which TLs and PSTs examine multiple dimensions of their shared practice: these dimensions might include examining strategies and approaches for student learning, collaborating with and learning from their peers, identifying specific problems that the school and university facilitators face, and examining in a meta-way problem-solving patterns. It might also include analysis of the partnership itself—how it was set up, changed, and remained flexible. Throughout this process is the bedrock acknowledgement of the value of teacher knowledge and expertise within authentic partnerships.

Finally, while this study focused on the micro-level of David's response to the pandemic, it needs to be acknowledged that his decisions and actions were nested within a larger district context of relative wealth. Demographics reflect the growing affluence of the town: in 2000 the median family income was $64,000; in 2020 it was approximately $116,000 (with over 5% of the population below the poverty line). Both OMS and PHS were flagship schools which benefited from considerable funding. Furthermore, many of the families worked within the technology sector, with a number of technology industries clustered around the school. There was also the benefit of the school-university partnership itself, but perhaps it needs to be noted that the partnership was largely unfunded and was maintained by David and Lewis's commitment to it.

Conclusion

The pandemic intensified tensions within the complex ecology of public education and underscored the role teacher leaders play within a crisis. As schools shifted from in-person to online environments, teachers were handed new software but tasked with traditional challenges: engaging and educating children. The huge contribution of teacher leaders to keeping schools open and relatively functional during a long period of international crisis needs to be acknowledged.

In this study, we have sought to highlight one remarkable and situated story of a teacher leader. In his school-university partnership, David redesigned and re-implemented a program within one weekend. While this situation was (and is) horrific, it did help to (begin to) clarify the depths of teacher expertise. We suggest that this expertise needs to be foregrounded within public education as a form of grounded systemic leadership. Decades ago, the Holmes Group (1986) called for a career ladder to allow expert teachers to share decision-making with administrators and bridge the gap between K-12 education and post-secondary teacher education. The findings of our study underscore such a worthy goal.

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