

Article

Attributes and Knowledge of the Lead Organizer in Planning a Virtual Teacher Professional Development Series: The Case of the Organizer of the Schoolyard Network

Michael Daiga * and Mackenzie Hessick 

Department of Education, Wittenberg University, 200 W. Ward Street., Springfield, OH 45504, USA;
hessickm@wittenberg.edu

* Correspondence: daigam@wittenberg.edu

Abstract: Teacher professional development opportunities are woven into the structures of license renewal and school expectations, but the opportunity to profoundly develop in a professional and broad manner is still often a struggle for educators because of financial and time-oriented constraints. The Schoolyard Network is a professional development series of virtual meetings conducted by the Great Smoky Mountains Institute at Tremont to support participating educators in exploring outdoor learning opportunities with K–12 students. This key case study describes the Schoolyard Network’s lead organizer’s knowledge and perspective of running this exemplary case of a virtual outdoor experience platform. Findings suggest that the utilization of an outdoor, experiential, inquiry-based design, while prioritizing mindfulness and conversational techniques such as active listening, reflection, and relationship building are effective design principles for virtual teacher professional development, albeit through a complex, unique system. A model of impact suggests that the Schoolyard Network structure provides meaningful STEM experiential learning activities for educators impacting classrooms across a broad range of environments and geographic proximity.



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1. Introduction

The emergence of Science, Mathematics, Engineering, and Technology (STEM) as an integrated, cohesive knowledgebase is changing how schools and communities prepare students for society. The direction of a student’s attitude toward future STEM careers can be altered when STEM is coupled with real-world applications (Binns et al., 2016), especially when applications extend outside of school buildings into communities, work environments, or broadly speaking, to the outside world (CoSTEM, 2018). Given teacher shortages and the complexity of recruiting, retaining, and growing strong cohorts of teachers (U.S. Department of Education, 2024), STEM professional development leaders who design and implement professional development are a critical bridge to supporting and retaining practicing teachers (Bintz et al., 2017) and can provide support structures to stabilize school staffing issues.

The Great Smoky Mountains Institute at Tremont (GSMIT) is an established STEM and outdoor education organization that, for the past 54 years, has served educators and students (GSMIT, 2023c). GSMIT extends teacher professional development supports

beyond STEM and outdoor content by encouraging educators to coteach customizable programs, with cross-cutting themes woven into STEM lessons including political science, social-emotional learning, and sustainability topics. In order to lessen the impact of financial and travel challenges for schools, and to stay connected to educators during the COVID-19 pandemic, GSMIT created the Schoolyard Network as a virtual space for educators to collaborate and discuss pedagogical strategies for schoolyards (GSMIT, 2023b). The Schoolyard Network is a professional learning community (PLC) or an organizational structure that researchers found to help improve student learning through teacher training (M. Lee et al., 2022; Stoll et al., 2006). The Schoolyard Network (SYN) provides teachers with a PLC that prioritizes teacher autonomy (DuFour, 2004) through regular monthly meetings on Thursdays from 4:30 to 6:00 p.m. supporting the call to provide educators explicit support to plan and implement outdoor lessons at their schools (Davies & Hamilton, 2018). With support, educators can avoid common misunderstandings that school outdoor spaces are not laboratories for learning (Correia et al., 2024; Huggins, 2012), and remove barriers to help students learn in outdoor environments (Edwards-Jones et al., 2016; Feille, 2017; van Dijk-Wesselius et al., 2020). There is evidence in PLC research showing that leadership is often a key stakeholder to the PLC's success as a driving force in pedagogical transformation (de Jong et al., 2023; Stoll, 2020). Led by an experienced, expert lead organizer from GSMIT, the Schoolyard Network educators work together through a series of professional development sessions during the academic year to discuss and implement highly effective pedagogical methods utilizing outdoor learning in their individual, unique local schoolyards.

Connecting educators to biodiverse learning environments during professional development is an actionable intervention to improving sustainability education for K-12 students but is often unachievable because of financial and time constraints. By providing educators access to a place-based PLC focused on teaching outdoors, educators can replicate these powerful inquiry-based experiences with their K-12 students. Designing meaningful professional development sessions is complex because professional development needs to connect with an educator's identity, operate within school constraints, and be culturally responsive (Carrier et al., 2014; Darling-Hammond et al., 2017b) along with avoiding pitfalls that can feel unavoidable such as a dysfunctional school culture or lack of shared vision (Erawan & Erawan, 2024). Given the complexity of designing meaningful professional development, our research team investigated the lead organizer of the Schoolyard Network, given its exemplary online, organizational structure and extended community impact.

The aim of this key case study is to provide a model describing the structure supporting the Schoolyard Network and answer the following research questions:

- (1) What is the organizational structure that supports the lead organizer of the Schoolyard Network to make pedagogical choices for this PLC?
- (2) What experiences does the lead organizer have that drive the Schoolyard Network?

The findings of this research aim to provide further support on how to combat calls to improve the outcomes of STEM higher education (Davies & Hamilton, 2018; Gamage et al., 2022; Taylor, 2012). Given educators are wanting and willing to progress past replicating indoor-instruction outside a school building (Maynard & Waters, 2007), meaningful, timely, relationship-driven professional development like that provided by the Schoolyard Network might be the missing support for educators. The remainder of this article is as follows: Section 2 provides organization background about GSMIT and experiential outdoor learning. Section 3 describes the materials and methods utilized grounding this key case study. Section 4 describes the results and offers a model describing the leadership structure of the Schoolyard Network PLC. Section 5 presents a discussion with key attributes PLC organizers should consider in the design process.

2. Organizational Background and Theory

Delivering meaningful outdoor, inquiry-based lessons requires knowledge involving both content and pedagogy. We know educators often begin the transition to using outdoor lessons with content knowledge limitations (Jenkins et al., 2015) suggesting we should support educators with meaningful, systematic professional development before sending them off to try pedagogical tactics on their own (Darling-Hammond et al., 2017b; Erawan & Erawan, 2024). There is evidence that consistent, outdoor experiential learning professional development can lessen the chance for negative outcomes for K-12 students during outdoor experiential learning opportunities (Carrier et al., 2014; S. Lee, 2019) and the key to understanding most successful professional development opportunities often lies in understanding the human leadership team-making decisions about *what* information is delivered in the professional development and *how* that material is delivered. In other words, a single person with the right knowledge and experience skillset can often effectively design and implement meaningful professional development for educators. Therefore, conducting a case study focused on the key leader of the Schoolyard Network provided the mechanism for understanding the organization's effectiveness.

A case study allows researchers to study the complete picture along with analytic insights through an in-depth investigative process on a topic of research (Thomas, 2021). This case study focuses on the experience, characteristics, and decisions the director of GSMIT's Schoolyard Network demonstrates to organize the professional development sequence. Researching key personnel who hold deep pedagogical knowledge as to how to evaluate and implement outdoor lessons is meaningful to consider how similar PLCs could emerge in other organizations with other teacher populations. Since 1969, GSMIT has continued to evolve their clear mission of impacting youth, educators, and adults through a variety of programs that promote self-discovery, critical thinking, effective teaching, and leadership (GSMIT, 2023c). The experiential learning activities available at GSMIT are woven with academic rigor, providing the necessary support for educators to compose their own lessons in their own schoolyards even though schoolyards are limited, or provide challenges in cultivating relationships with nature. The challenge extends beyond the limitations of outdoor wildlife to lessons-design limitations in clear connections with indoor curriculum and limited administrative support resulting in unrealized opportunities (Dyment & Reid, 2005).

As the calls for revolutionizing sustainability education continue to increase (OECD, 2021), global challenges continue to emerge for classroom educators to design, develop, and implement meaningful experiences situated in context for their students. But we know student growth while experiencing outdoor learning opportunities reaches beyond just learning content, and into physical, social, and mindful developmental milestones (Johnson, 2007). Often these developmental milestones are less celebrated or translate poorly to high-stakes assessment scores. However, developmental milestones significantly impact K-12 students and their teachers who love and long to see student growth and development.

2.1. Background on the Great Smoky Mountain Institute at Tremont

A solid organizational support system committed to educators, students, and the local and extended community is essential to building long-term relationships with educators. GSMIT is a non-profit organization that collaborates with the Great Smoky Mountain National Park organization to help deliver critical programming opportunities through residential programming, research, community engagement, and advocacy for outdoor learning initiatives (GSMIT, 2023a). The individuals that are attracted to GSMIT can participate in programming for adults and families, summer youth, and teacher professional development opportunities on campus. All these programming opportunities focus on the

goal of connecting individuals to outdoor learning in a unique, hands-on manner. Intricate, carefully planned programming emerges across a variety of groups visiting GSMIT's campus including opportunities to learn photography, become naturalist certified through the Southern Appalachian Naturalist Certification Program, themed youth programming such as the Girls in Science camp, and wilderness backpacking opportunities (GSMIT, 2023b).

One of GSMIT's major organizational efforts is to improve connections with school districts and educators because they are key stakeholders in promoting, connecting, and sending visitors to GSMIT's campus. To streamline the connection with educators, GSMIT has established housing and meal structures on its campus, eliminating or lessening many logistical challenges that educators struggle with during field trips or experiential learning opportunities. The place-based programming provides opportunities for educators to learn how to teach outdoors while lessening logistical burdens by using campus resources.

2.2. Background on GSMIT's Educator Programming

GSMIT provides a variety of outreaches targeting educators across K-12 grade bands and subject areas. For example, GSMIT offers Teacher Escape Weekends where educators come to campus for a weekend and engage in experiential learning opportunities and prepare educators for their class trips with students during the coming year. This outreach aims to support cooperative teaching between Tremont faculty and practicing K-12 educators to deliver hands-on lessons and develop confidence through coteaching activities. Perhaps most importantly, Teacher Escape Weekends provide a mechanism to entice educators to the GSMIT campus with other like-minded educators and cultivate relationships to support pedagogical development.

GSMIT provides other programming options aimed to connect to educators including Schoolyard Network programming, Schoolyard Escape, and Schoolyard Walks. The Schoolyard Network is a series of monthly, virtual professional development sessions conducted at convenient after-school times for educators to enact inquiry-style, outdoor experiential learning lessons. The Schoolyard Escape is a single-day workshop hosted at a centralized school that provides educators who attend the Schoolyard Network sessions the chance to apply lessons learned, catering to a variety of educator experience levels with outdoor pedagogy through carefully designed programming and grouping. Schoolyard Walks are a new programming effort that include GSMIT faculty visits to schools with the purpose of helping to design and provide outdoor lesson support structures for educators. The variety of teacher professional development opportunities provide options for K-12 educators to choose how to connect professionally with GSMIT in a manner that fits their circumstances.

The Schoolyard Network and the Schoolyard Escape are both exceptionally rare examples of PLC outdoor experiential professional development programming that is being conducted by non-profit organizations connected to the National Park System. The regular schedule, consistent leadership and participants in the PLC provide a unique case study opportunity. Teacher attendance of Schoolyard Network monthly sessions has grown substantially since its inception in 2020, with attendance numbers during the first two academic years averaging around six regular attendees committed to the PLC. During the 2022–2023 academic year, the PLC grew to 15 regular attendees with usually around five newer or perspective participants across sessions, while during the most recent academic years there are 20 regular attendees and five newer or perspective participants. The group is supported in-between monthly session meetings with reminders and additional posts of information to maintain a connection between group members. Similarly, the Schoolyard Escape continues to be a culminating, in-person connection Schoolyard Network PLC members attend, with registration maxing-out at 30 participants each of the last three years.

3. Materials and Methods

The design of this case study was crafted to articulate the lead organizer's pedagogical choices for the Schoolyard Network because of its exemplary reputation for providing virtual experiential learning professional development for educators across the Midwest and Southeast. GSMIT was selected because it is one of only two non-profit organizations in the United States (i.e., Teton Science School) that runs a regularly meeting PLC operating closely with the National Parks Service. The Schoolyard Network organizer is a key case study or is a near-perfect example of an organizer who runs a very successful, ideal, outdoor virtual learning professional development series, allowing for direct insights into a topic (Thomas, 2021). The perspective, knowledge, and pedagogical choices of the lead organizer provide a descriptive example of how educators engage with the Schoolyard Network. Illustrative, descriptive, and authentic artifacts connecting the leadership structure, professional development sessions, and experiential learning were gathered, analyzed, and refined. Because the goals of the Schoolyard Network are to connect a community of educators with each other to highlight successes, ask questions, share resources, and build camaraderie through specially designed professional development sessions (GSMIT, 2023b), the lead organizer's professional experiences and pedagogical decisions for sessions are the funneling mechanisms for teacher professional developmental outcomes.

This case study aimed to understand the Schoolyard Network's lead organizer and their pedagogical choices in planning the Schoolyard Network. The research was conducted through in-depth interviews following completed Schoolyard Network sessions to learn about the enacted professional development techniques. Semi-structured interview protocols were used to guide conversations and understand how the lead organizer successfully planned SYN session experiences and provided guidelines for researching the complex knowledge involved in planning professional development opportunities. Using written transcriptions, emerging themes were confirmed across research team members. Semi-structured interviews aimed to understand and articulate different constructs that are woven into Schoolyard Network sessions including the role of STEM content knowledge in professional development design, the role of pedagogical knowledge in professional development design, the support structure of professional development activities to utilize productive struggle and the lead organizer's beliefs and efficacy about the program and outdoor learning. The research design utilized multiple Schoolyard Network sessions to weave together the key characteristics and attributes of the lead organizer, providing a lens into their professional development choices. Overarchingly, data sources were woven together to describe what key attributes existed in the lead organizer to successfully and consistently implement this professional development program.

A macro-view of the research design consisted of a series of four semi-structured interviews completed over the course of four months after members of the research team observed four unique, Schoolyard Network sessions. The Schoolyard Network annual design is structured to run professional development for eight sessions, so studying half the series seemed reasonable to understand the pedagogy and organization without overburdening the lead organizer and research team. This interview structure also provided an opportunity to preliminarily analyze session transcripts and improve and develop subsequent interview protocols for the following Schoolyard Network session.

Interview protocols were designed to increase the depth of conversation and understanding of the construct at hand (i.e., the lead organizer). Pre-coding through the form of preliminary jottings was utilized with both the goal of understanding the construct (Saldaña, 2013), but also improving question quality in subsequent interview protocols. For example, questions that lacked specific responses in the first interview were sometimes followed up in a second interview question by asking the lead organizer for a specific

example from their life concerning the topic at hand. This responsive process allowed for not only improved question development but also allowed for the coding process to be a cyclical act of analysis (Basit, 2003) that allowed for the meaning-making process to begin early.

Transcripts were electronically transcribed and then manually blinded, followed by unit breaks (Gale et al., 2004) to arrange text into bundles of the lead organizer's commentary, to highlight topic or subtopic shifts and prepare transcripts for descriptive coding (Miles & Huberman, 1994; Saldaña, 2013). Themes were then developed separately across the coding team with an emphasis on meaning making (Thomas, 2021), linking word choice across researchers to the qualitative data presented utilizing tabular markings and cross-interview connections. Developing themes from the data were considered an appropriate process given this qualitative study explored an individual's psychological world, constructs, and identity development (Smith et al., 2008). Themes were refined together through conversations and debates to categorize and then form an analytic synthesis of overarching themes (Rubin & Bellamy, 2012). These overarching themes were the backbone in conversations to develop a system theory of the lead organizers guiding experiences, vision, and consequently the Schoolyard Network's professional development design. Disagreements by researchers were resolved by using further analysis of data and multiple meetings to discuss codes, themes, and overarching themes. Finally, to improve the trustworthiness of the results, the research team utilized member checking techniques, or sharing findings with participants to validate the findings (Espedal et al., 2022). The researchers used member checking by offering the lead organizer an opportunity to approve their narrative contributions of the study in the research report in rough draft and final draft forms (Carlson, 2014; Creswell, 1998).

4. Results

Successful professional development experiences for educators are carefully planned and intricately layered (Darling-Hammond et al., 2017a; Fairman et al., 2020). We know that teacher capacity to manage their professional life phase is complex and dependent on resilience (Gu & Day, 2007). With the primary goal of this article being to articulate the SYN lead organizer's skills, attributes, and design choices in developing this series of professional development opportunities, the following model in Figure 1 provides an outline of their perspective. Past (i.e., Lead Organizer Experiences), future (i.e., Lead Organizer's Vision for the Future), and the resulting professional development design attributes embedded in the context of GSMIT's Mission and Philosophy are discussed in detail with codes to support the model.

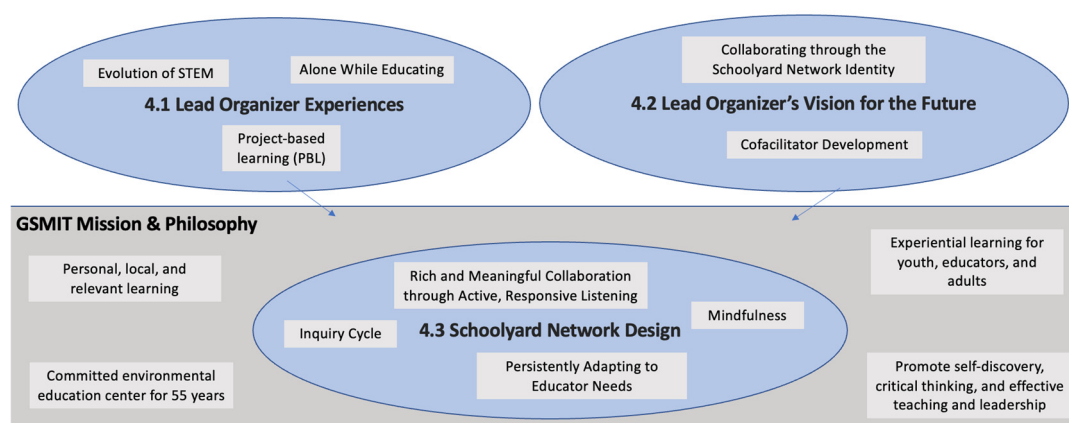


Figure 1. Schoolyard Network visual of lead organizer.

An important distinguishing attribute of the model in Figure 1 is how the lead organizer's experiences and vision interact with the GSMIT's mission and philosophy (GSMIT, 2023a) which functions as the underlining support for the Schoolyard Network. GSMIT is historically well known for its ability to deliver impactful, in-person experiences for K–12 educators and students, but the COVID-19 pandemic and transitions to remote instruction repositioned how K–12 teachers were connecting with the organization. Therefore, the design of SYN sessions has deeply grounded philosophical underpinnings that influence the decisions of the lead organizer. The following result sections are organized to describe emergent themes of the lead organizer's influences within the organization context. A series of quotes from interviews are provided as examples of statements that led to overarching themes.

4.1. Lead Organizer Experiences

The lead organizer's background was uniquely positioned for a role in organizing and cultivating a deep community in the Schoolyard Network. Professional experiences led to three major developmental themes influencing the Schoolyard Network's core: alone while educating, the evolution of STEM, and project-based learning (PBL).

4.1.1. Alone While Education

At the beginning of their career, the lead organizer felt isolated. There were a variety of factors that led to the deep-rooted feeling of loneliness; they were the only English as a Second Language (ESL) teacher in their school building, they had classes of students across grade levels, and there was no PLC or meaningful educator community for support. The lead organizer's experiences with loneliness influence how they reach out to educators in the Schoolyard Network. There are intentional pedagogical design choices and actions during Schoolyard Network sessions to reach educators across the virtual platform. Personal experiences of loneliness were a driver for an intense interest in connecting practicing educators to in-person activities, including the development of the Schoolyard Escape and trips to Tremont. An interview response near the beginning of the interview series highlights the lead organizer's loneliness struggle:

"And I felt alone constantly. I felt on an island. I was the only ESL teacher in our building and just so like I had to figure it out myself in every definition of that of that word. It was hard. So you know, I kind of came into teaching feeling like it's a like figure it-out-for-yourself job and I did. But it wasn't that sense of community that I think in undergrad we were all hoping we're for like, oh, we're all going, like, plan together and think about how kids can work together and like there's all these visions of what could be and that unfortunately, at the beginning of my career was not the reality I was faced."

Because of the lead organizer's loneliness experiences, Schoolyard Network sessions clearly attempted to understand how educators are feeling after the school day, even with the challenge of connecting virtually through technology.

4.1.2. Project-Based Learning

After transitioning from a more traditional teaching role with Teach for America, our lead organizer transitioned into an instructional coaching role seeking to support educators through similar types of challenges. From the lead organizer's perspective, this professional stage shifted their foundational pedagogical beliefs through applications from the text by Marcia Tate called *Sit and Get Doesn't Grow Dendrites*. A primary theme of the text is that adult educators (like K-12 students) are not perceptible to learning through repeated lecturing. For professional development to be effective educators they need to actively engage with one another for professional development (Tate, 2012).

The lead organizer then joined a school committed to the curricular design of utilizing PBL across subject areas. The lead organizer was able to see how rich and conducive learning could be when educators encouraged students to incorporate knowledge from science, reading, math, and the arts. In this PBL environment, they saw students connecting learning to their life experiences and making meaning of their learning discoveries. Perhaps more important professionally, the lead organizer was being encouraged to collaborate in lesson creation with educators from other disciplines and work through challenges of cofacilitating learning.

“And in that school, we saw and approached teaching and learning as through-line questions. So how do we make learning connected so that our students are seeing that math and English and science and history and social concerns are not separate, but they all build off of another, interact with each other, and are connected and in traditional schooling it’s like you get 45 min of math, you get 45 min of the science and they never talk to each other. And at this school, there was an opportunity for kids to see and make meaning across content areas. And because of that, it really leveraged teacher collaboration so that teachers are talking to another, planning with one another, and feeling empowered to help their students make those connections.”

The lead organizer’s professional experience at this PBL school was pivotal in their pedagogical development and aligned closer to the GSMT philosophical underpinnings. The impact of the lead organizer’s time at this PBL school influences how the Schoolyard Network format is interactive and engaging for educators. The Schoolyard Network consistently provides educators an opportunity to collaborate with peers, adapt teaching strategies, and actively partake in building lessons.

4.1.3. Evolution of STEM

The lead organizer changed their interest and effort in teaching STEM over their career, initially funneling towards the pathway of English, creating a sensitivity and awareness to supporting female students to enter STEM fields. Because of their firsthand experience being funneled away from a STEM career, programming decisions for the Schoolyard Network are careful to consider how student groups, especially those underrepresented in STEM fields, are being supported throughout activities.

“But everybody was like, you’re a good reader and writer like you should, like, go into English. And so I just listened to that because that’s what I was like told I was good at. So, but I never loved it. I never felt in those classes the way I saw other students feel in those classes, but in my science classes, I felt that excitement.”

4.2. Lead Organizer’s Vision for the Future

The lead organizer is currently mentoring a new cofacilitator. In a similar manner to how our lead organizer became the Schoolyard Network lead, the organization looks to cultivate multiple leadership positions to ensure a system is in place to help the Schoolyard Network function beyond one individual. Cofacilitating provides opportunities for reflection on sessions and planning conversations.

“I think it’s important that we build systems and not just people.”

“And so we have those conversations in our reflection time of like, what did we think went well? What do we want to think about next time? to give her space to grow as a facilitator.”

4.2.1. Cofacilitator Development

Although there are some constraints (i.e., time, other work demands) and guidelines (i.e., teaching experience) on decisions and how leaders are selected for a role in running the

Schoolyard Network and GSMIT programming, there is clear intent by GSMIT leadership to provide faculty with decision-making power in their programming. In order to grow the Schoolyard Network, guidance from the other cofacilitator is provided, focusing on three major themes that function like support-structures to prioritize teacher autonomy in PD: (1) be who you are, (2) have a multi-tiered timeline woven into a North Star vision, and (3) provide clear directives across cofacilitators during Schoolyard Network sessions.

“You have to kind of try on what feels right and what feels right might not be what you thought . . . it would be at the beginning.”

“At the call at the activity level, at the call level, at the yearlong planning level, and at the multiyear long planning level like we do regardless of how we facilitate need to know where we’re headed and why and let that be the guiding like North Star of you know making all the decisions in the in between.”

“Whether it’s kids with behavior or adults with confusion, like a lot of that is born out of gray space. So, if we can eliminate the gray space with the clarity of the directions we’re giving, we’re setting all people up for success, and that can take practice too.”

4.2.2. Collaborating Through the Schoolyard Network Identity

The Schoolyard Network lead organizer understands the importance of collaborative efforts with key entities in the surrounding community. Day-to-day interactions regularly involve colleagues collaborating authentically, creating a workplace environment that can prioritize educators and students who visit GSMIT. All GSMIT staff are unique in their interests and expertise; for instance, some are naturalists with degrees in biology and others, like our lead organizer, majored in fields like English or education. This allows the lead organizer to rely on different members of the GSMIT staff for a wide range of projects. Most commonly, the lead organizer will utilize certain individuals as “thought partners” for planning or adapting within the Schoolyard Network. The cultivation of relationships provides the backing for authentic interactions and better programming.

“We always like call it watercooler talk, sometimes the most valuable things you get out of an experience are during that watercooler talk time because you have this question and you are talking and walking with this other person that you can ask it to or you heard them say something that was really inspiring to you or that you want to try.”

Fostering collaboration with like-minded external organizations is valued by GSMIT and provides a support system for the lead organizer. For example, GSMIT participates in the Knox Outdoor Learning Coalition which brings together over 35 organizations from Knoxville (e.g., the Knoxville Zoo, the Botanical Gardens, the University of Tennessee Gardens, etc.) who all aspire to involve kids in outdoor education. A primary goal of the Knox Outdoor Learning Coalition is to collaborate, streamlining programming for the community and eliminating overlapping programming. However, participating in the Knox Outdoor Learning Coalition also provides the lead organizer a chance to interact with leaders from similar organizations and self-reflect on the programming of the Schoolyard Network.

4.3. Schoolyard Network Design

The Schoolyard Network sessions are educator centered at the core. Session pacing decisions were consistently adjusted based on feedback from attending educators. During a PLC session, attendees regularly feel autonomy over their decision-making as they participate, connect, and reflect.

4.3.1. Rich and Meaningful Collaboration Through Active, Responsive Listening

Although Schoolyard Network sessions are virtual, the lead organizer engrains peer interaction into each inquiry-style session. Perhaps a distinguishing aspect of this PLC is the lead organizer structuring inquiry-style collaborative sessions while focusing intensely on attending educators and actively responding depending on circumstances. This relationship-driven characteristic of the Schoolyard Network works contrarily towards striving to meet each session's content and pedagogical development outcomes, but seems to provide the deeper identity support educators are searching for in the PLC.

"And sometimes, like people, whether it's a teacher or not, need just somebody to listen. And like affirm and nod and like, give that active listening body language. Sometimes people need a coach where you are helping them, like, come to an answer. But they have the answer in their brain and you're asking questions to help them pull that answer out. And they are like solving their own problem through that process. And sometimes people need to consultant. Sometimes you're just like I need the answer. I want you to give me the answer. Like, what would you do?"

Participants communicate, collaborate, and problem solve through a variety of pedagogical techniques throughout each session. The introductory period includes separating into small groups for meaningful introductions to build multisession relationships. There is also space for educators to celebrate the successes of one another and share challenges they are experiencing at school during the first fifteen minutes. Once the main exploration portion of the session begins, one of the Schoolyard Network leaders will pose deep-thinking questions to the participants, who are paired in "breakout rooms" to collaborate through the answers. Leaders will rarely share personal responses or answers with participants as the leadership team believes that would rob them of their opportunity to learn. Allowing participants to work through questions together cultivates peer-to-peer understanding and self-efficacy across the PLC.

Active, responsive listening by the lead organizer extends beyond sound during Schoolyard Network sessions with their careful use of the chat feature online to include and build up individuals during sessions. Chat features are not commonly used as a technique to connect with session participants, build relationships, and monitor mental health of participants, but in this PLC this technique is frequently implemented.

"What everybody else can't see is that I have the chat open the whole time. And so oftentimes I'm chatting one on one with people in the group and they will I be like, hey, just checking in like or it's nice to see you. And even just like that greeting or that like that invitation into this space will later lead to, like actually had this question that I didn't want to ask whole group and we're like typing about that back and forth."

A regular action the lead organizer used before sessions started was as educators joined, they were greeted and asked about their personal well-being. Often these greetings include personal connections to family activities, classroom experiences, or interests. Not only do these conversations demonstrate the lead organizer's desire to build connected relationships with participants, but they can also serve as a touchpoint for the lead organizer to better understand the day-to-day struggles educators are facing. There are further opportunities to cultivate participant-driven discussion opportunities as each session officially starts, where educators are encouraged to share their challenges, successes, and questions. Carefully designing this time as an "invitation" with the group provides the opportunity for educators to approach the PLC at their own pace.

"I'm inviting you to do this . . . that in that intentional language of invitation. It is born out of really valuing that people feel seen, that we care about what they say and what they're sharing."

4.3.2. Persistently Adapting to Educator Needs

Since its conception during the COVID-19 pandemic, the Schoolyard Network continues to adapt to match the ever-changing realities of educators. At the beginning of lockdown, educators had to provide virtual learning opportunities for their students. Eventually, this evolved into a hybrid mode of in-person and virtual education before finally moving back to completely in-person classrooms again. Before the current lead organizer of the Schoolyard Network began facilitating sessions, the initial leaders were mainly concerned with addressing the need at the time, providing outlines of outdoor STEM lessons that educators could use with their students in a virtual space. These lessons were “grab-and-go” style templates that educators could quickly take from a Schoolyard Network session and use in their virtual classroom. For example, a lesson called “My Secret Plant” was used where students would explore their own outdoor space to find a special plant and draw a map describing where the plant was located. Then, students pair and search for the plant with the map and discuss distinguishing characteristics of their plants and overall environment.

When the lead organizer was hired at GSMIT, they spent a few months cofacilitating the Schoolyard Network with the original leaders. During this cofacilitation period, they gained an understanding of the help educators needed as well as an appreciation for the session structure the original leaders established. As they began facilitating on their own, they maintained the same structure as before, but felt that as the pandemic regulations eased, educators had less need for “grab-and-go” activities and were asking for more understanding of outdoor and experiential inquiry learning. The “My Secret Plant” lesson discussion was changing; educators now discussed deeper aspects of the lesson, such as integrating different subject areas into the “My Secret Plant” lesson, and differentiating based on grade level or ability. Some participants were comfortable enough now with the concepts being discussed that they began writing their own outdoor learning lessons.

In its current form, the Schoolyard Network continues to grow towards having deeper pedagogical discussions about outdoor and STEM education. The lead organizer explained that the pedagogical shift is driven by questions coming from educators, such as the following:

“What kind of feedback do I give a struggling student on this activity?”

“How do I encourage my students to ask deeper questions that push their thinking?”

During one Schoolyard Network session a pedagogical question caused the session to run for an additional 20 min, demonstrating participants’ deep-interest in pursuing pedagogical conversations. These teacher-driven actions provide evidence of why the Schoolyard Network continues to develop into an exemplary outdoor PLC.

The Schoolyard Network has other feedback mechanisms besides the in-person, organic feedback including an April annual survey. One adjustment the annual survey feedback suggested was to update the cohesive, annual design of sessions to change based on educator needs during different times of the school year. For example, at the beginning of the academic year, the Schoolyard Network sessions typically discuss setting boundaries in an outdoor classroom or how to facilitate outdoor learning activities easing students into the new outdoor learning environment. Lessons discussed early in the year are designed to be facilitated in a way that sets students up for success, builds stamina in the outdoor learning context, and allows educators to practice class routines before experiences become more complex. By the end of the year, educators are comfortable with outdoor management routines, so Schoolyard Network session designs shift to conversations about educational theory and deeper nuances of the inquiry learning cycle. With consistent adjustments over the year based on the needs of the PLC, the Schoolyard Network provides a thought-

ful design to understanding how to support educators through a series of professional development sessions.

Perhaps the most poignant Schoolyard Network adjustment was the response to educators wanting to see each other's schoolyards and celebrate the end of the series of sessions with an in-person event called the Schoolyard Escape. During the Schoolyard Escape, participants travel to the same schoolyard to interact in-person to design and analyze curricular experiences they could plan in this unique setting. The Schoolyard Escape is a relationship building event that provides different professional sessions where educators put on the learner's hat and self-select sessions based on experience with outdoor learning, content area expertise, or perhaps another factor to help deepen conversations. During an interview, the lead organizer described the connectivity of the Schoolyard Escape as follows:

"We met each other in person this summer, and they didn't know each other before the Schoolyard Network. Had never talked, never met, they didn't even live in the same state. And then, (they) decided to meet up over the summer to hang out in person."

The Schoolyard Escape is developing into another extension of this PLC that is deepening relationships for monthly meetings and providing more confidence for educators to voice and support each other during PLC sessions. Schoolyard Network sessions regularly and purposefully build in time for educators to have a voice and support each other in their challenges. During this "parking lot time", if a participant voices their struggles with classroom management in their outdoor classroom, other participants will have the opportunity to respond with strategies that have worked in their experiences. With a structure of weaving in-person events with Schoolyard Network sessions, the professional development series is noticing participants reaching out to each other more for support and growth as PLCs should function.

If the lead organizer does not hear from a specific participant in the initial greetings or during parking lot time, they will typically message the participant in the chat to understand any potential gaps in their learning. If a participant reveals a misunderstanding or point of confusion, the lead organizer will typically pause the whole group conversation to discuss the topic highlighting the obstacle. In PLCs, it is common for many people to experience a similar struggle but be hesitant to show misunderstandings broadly.

"We built in the parking lot time at the end because I was feeling disconnected with some of the participants. And I'm like, I don't really know where like in what sense are you feeling good about taking this and putting it into practice? And where are you feeling hesitant or what things are top of mind for you right now?"

4.3.3. Mindfulness

Teacher workload demands are intense. To address the need for a mental reset, the lead organizer has maintained the tradition using a mindfulness moment near the beginning of each session. A mindfulness moment within the scope of the School Yard Network can appear in different forms, but all revolve around ensuring that participants feel present and connected to the shared space.

"So recognizing that regardless of what you're day has looked like, there's just a lot of noise happening for all of us, whether it's in our own lives or things happening in the world. Your to do list is like constantly growing so giving people the permission and inviting them to connect with themselves and release the day so that they feel like they can be fully present with the next hour and a half that lies in front of them, with the people that are there and the things that they're going to be doing. I have heard a lot of feedback of just how nice that feels, how powerful it is. Oftentimes you can see the difference in demeanor even on screen of like pre-mindful moment and post."

An example of a mindfulness moment is when the lead organizer asks participants to shut their eyes and focus on the different senses they are using and what is happening with them. For example, the lead organizer may ask participants to focus on five things they can feel, four things they can smell, and so on. The aim of these simple exercises is to “declutter” the minds of busy educators, allowing their minds and bodies to be fully present during each PLC session. From the perspective of the lead organizer, there is a significant difference in body language and engagement before and after the mindfulness moment. Pausing and providing educators with selfcare time may seem like it is in a juxtaposition with accomplishing the learning outcomes and content goals for the session, but the pause seems to reset educators and provide the PLC cofacilitators with opportunities to be present at that very moment with participants. By weaving together selfcare strategies and usable lessons, participants see the benefit of dedicating time to the Schoolyard Network.

“Teachers say, like I didn’t know how badly I needed this. Like I’m leaving here with ideas for my classroom, and also I’m leaving here feeling like I have a had a reset as a human and we value those things equally because it’s like we can only be as good of teachers as we feel. And so valuing the whole person not just that career aspect of person is really important in trying to be intentional with that.”

4.3.4. Inquiry Cycle

The Great Smoky Mountains Institute at Tremont aligns many of its instructional practices with the Better Environmental Education, Teaching, Learning, and Expertise Sharing (BEETLES), a collection of educators committed to improving the quality of outdoor and experiential education. The BEETLES organization is committed to researching how students best learn through outdoor environments. Among the most critical qualities of successful outdoor learning experiences are lived experiences, prior knowledge, and constant discourse ([The Regents of the University of California, 2024](#)). To create an accessible model for educators to follow, BEETLES created a learning cycle that includes five phases: invitation, exploration, concept invention, application, and reflection. BEETLES also provides educators with resources to implement productive discussion throughout lessons ([Sassi et al., 2013](#)). Each phase allows students to connect with the targeted concept in a different way, pushing students to continue making discoveries and challenging their initial viewpoints.

“I love that we are working with this inquiry framework because it is applicable no matter what you’re teaching. Like inviting kids into a learning experience, encouraging them to get curious and tap into background knowledge, exploring and asking questions and struggling through something that you don’t quite, you don’t quite get yet. And then making time for reflection. If we could all do that in our teaching and think about teaching experiences, learning experiences, in that way, I think that is a step forward.”

Schoolyard Network sessions follow an abbreviated version of the BEETLES learning cycle, modeling for educators how to use the learning cycle within a constrained timeframe. The lead organizer breaks the session into three connected arcs, labeled Invitation, Exploration, and Reflection. The first 15–30 min of each session is the “Invitation” portion of the learning cycle, where educators are introduced to each other, undergo a mindfulness exercise to focus their attention, and have open share about their outdoor experiences. By actively choosing to be a member of a learning exercise, the lead organizer observes learners “putting on the learning hat” and taking on greater responsibility for their learning. The next arc of learning takes about 45–60 min of the session which is called the “Exploration” phase. During this phase, the lead organizer will ask participants to go into their own outdoor space and complete an experiential learning activity. Participants have a combination of personal working time and collaborative work to ensure participants are

creating their own understandings and sharing their findings with others. The third arc or “Reflection” wraps up the cycle, taking between 15 and 20 min, and allows participants to fully discuss their takeaways from the learning activity. During this time, the organizer will ask participants questions, providing wait time to answer in a small-group or whole-group setting. This facilitation technique called a “culture of talk” encourages instructors to use broad questions that cultivate an environment that encourages students to listen deeply to their peers and share their own ideas ([The Regents of the University of California, 2024](#)). A key to successful Reflection times is having participants push answers to the open-ended questions that can have multiple different “correct answers”. The Reflection time created a highly interactive discussion environment for the Schoolyard Network facilitating conversations where many participants are open to sharing their discoveries and wonders.

“A broader philosophy that I would say I aligned with at Tremont in that there is a quote that says, “when you teach someone something, you are robbing them of the opportunity of learning it.”

5. Discussion

The impact of the COVID-19 pandemic presented drastic challenges for educators, shifting the method of instruction swiftly and causing stress on educational systems across the world ([Pokhrel & Chhetri, 2021](#); [Sahu, 2020](#); [Tarkar, 2020](#)). However, some initiatives like the Schoolyard Network that were born out of this time now positively impact educators and provide new, unimagined support. The Schoolyard Network has now grown into an online, convenient support system with over 300 registered members and around 20 regular attendees at PLC sessions. This article presents findings from a key case study with detailed information about the identity, attributes, and role of the lead organizer of the Schoolyard Network. Interestingly, the lead organizer’s view of STEM content was thought to be the cornerstone of decision making for planning sessions because clearly content plays a vital role in teaching and changing the state of education ([CoSTEM, 2018](#)). However, at the end of this research study, it was clear that four other attributes took precedence in many decisions that had to be made and STEM content functioned as a backbone, or foundational precursor to prioritize these attributes:

- Prioritizing rich and meaningful collaboration through active, responsive listening;
- Persistently adapting to educator needs;
- Utilizing mindfulness techniques;
- Delivering session material through the inquiry cycle.

These attributes support teacher development in understanding how to implement outdoor inquiry-styled STEM lessons while prioritizing participants. The organization structure, though focused on delivering inquiry-based outdoor lesson opportunities which are effective in professional development ([Darling-Hammond et al., 2017b](#)), prioritized opportunities for educators to participate, share, and reflect about the challenges that are unique to the field of teaching ([Yli-Panula et al., 2023](#)).

This theme of mindfulness provides a gateway to conversations about inquiry outdoor STEM education, dependent on the participant’s needs, providing a flexible session structure that could be an opportunity for growth in content knowledge or mental health development depending on each educator’s unique situation. Educators are unique human beings in one-of-a-kind situations and are growing in their own emotional competence in teaching and retaining key information from educator professional development ([Madalinska-Michalak, 2015](#)). Given case study research is readily accepted as a methodology that offers unique, in-depth, holistic insight into a specific phenomenon, but lacks generalizability and replicability ([Drew, 2023](#)) the Schoolyard Network’s story can be helpful if repurposed by other aspiring PLC organizers impacting local educators in other

locations. There are a few key lessons this research suggests prioritizing to cultivate a productive, impactful environment:

- Lead organizers of PLCs should provide in-person opportunities that can help build relationships, grounded in an organization's mission and philosophy. From the lead organizer's perspective, there was a clear connection in attending in-person events (i.e., the Schoolyard Escape), for multiple reasons including how visits to GSMIT helped educators engage in the professional development on a deeper level, but also to prioritize utilizing local places and investigations (Bocko et al., 2023).
- There is a palatable difference between inquiry-based virtual instructions and lecture-driven methods, both in what content is retained by participants and the impact on participant well-being (Pinheiro & Alves, 2024). As PLC session design decisions are made, finding places to have participants "put on the learner hat" should be prioritized.
- Organizers should intentionally develop a structure with multiple cofacilitators, ideally tiering leadership based on experience, attributes, and training as research suggests (de Jong et al., 2023). Staggering experience levels within the program so that cofacilitators not only understand the direction of the program but more importantly, connect with regular participants during sessions is essential to maintaining a virtual environment that educators will continue to join, even during the busiest months of the year.
- Providing the PLC's educators the opportunity to rethink instruction outside provides unique pedagogical opportunities that are hard to create inside a school. PLC organizers should consider using alternative, appealing, and convenient environments for sessions.

If our schools are going to continue to recognize the social and cultural needs for expanding outdoor education (Aasen et al., 2009; Correia et al., 2024) to meet the variety of evolving needs of students (Elias et al., 2003; Largo-Wight et al., 2018), PLC's need to creatively meet educator's given their hectic lifestyles. With flexible virtual and in-person programming, the Schoolyard Network provides a user-friendly method of delivering meaningful, consistent teacher professional development. The lead organizer of the Schoolyard Network is a critical decision maker in the pedagogical choices and session adjustment decisions that make PLC sessions successful for participants. But each educator impacted by the Schoolyard Network has a more critical role; educators have the unique opportunity to become powerful proponents of outdoor programming choices with their own students and with peers across school networks.

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