

Facilitating an Elementary School-Wide Immersive Academic Event

by Melanie Kinskey, Sam Houston State University; Mitch Ruzek, University of South Florida; & Dana L. Zeidler, University of South Florida

Abstract

Traditional science teaching has tended to focus on compartmentalized academic content that is removed from the practice of everyday life. Confronting this has been a perennial challenge in science teacher education, and the impact on the stifling of students' creativity, critical thinking, and engagement has been well documented in the literature. Progressive science teaching, however, emphasizes situating instruction in sociocultural contexts that engage children in the activity of learning by tapping into their natural instincts of wonder, curiosity, questioning, and actively seeking meaning about the world around them. This article describes week-long, immersive, inquiry-based events that university educators facilitate at local schools. The purpose of the events is to model how to engage students in inquiry-based experiences and stimulate their natural curiosity and, at the same time, facilitate professional development for teachers. These educative experiences are positioned in the notion of interdisciplinary, inquiry-based learning that drew from science, the creative arts, social sciences, language arts, and mathematics. During this week-long event, we build a community of engagement aimed at fostering heightened levels of academic commitment, developing natural inquiry skills, and cultivating authentic scientific habits of mind through inquiry that would captivate both students and teachers across multiple grade levels.

Introduction

A collective goal of science education entails instruction that provides students opportunities to connect what they learn about science to real world social and scientific problems (UNESCO, 2019) while enacting science practices (National Research Council [NRC], 2012). The *Preparing Teachers* report recognizes that science teachers should receive training that develops their abilities to provide students with opportunities to develop these skills (NRC, 2010). Often, however, this aim is not being effectively met and lacks results that properly prepare diverse student groups for authentic engagement with the real world (Roberts & Bybee, 2014). For instance, a recent study conducted by the National Horizon's Institute found that only 26% of elementary teachers nationwide are providing opportunities for their students to develop skills associated with critical thinking and problem-solving, and 37% of elementary teachers self-reported relying on textbooks to drive their science teaching (Banilower, 2019).

Science has traditionally focused too much on compartmentalized academic content that is detached from the ever-evolving experience of everyday life, thus stifling students' creativity, critical thinking, and engagement (DeBoer, 2014; Kahn & Zeidler, 2016). To prevent this from occurring, we argue that science teachers need access to a more innovative approach to science teaching, such as the immersive educative events described in this article.

Immersive events emphasize situational learning that is multidisciplinary, broad-based, and requires understanding of sociocultural contexts that engage children in inquiry by tapping their natural instincts of wonder, curiosity, and spontaneous questions (Zeidler, 2014). Our approach is similar to the work of Gilbert and Byers (2020), who advocate for the use of a wonder-infused pedagogical approach to educator professional learning, which involves preparing teachers to foster student-driven opportunities to wonder and be naturally curious about the world around them. Extant literature attributes the lack of professional development (PD) in this area to the disconnect between these innovative approaches to science instruction and what is typically occurring in classrooms (e.g., Banilower, 2019; Longhurst et al., 2016).

As science teacher educators, we aim to improve the instructional practices of in-service practitioners by providing professional learning experiences inclusive of opportunities to engage with science in a learner-based, educative environment that provides opportunities for students to employ their natural curiosity and problem-solving skills (Longhurst et al., 2016). It was with that intention that we developed and facilitated week-long, immersive events where teachers are learning alongside their students. The learning that takes place, however, varies slightly: While students are learning science content, teachers are learning science pedagogy. By immersing teachers in the inquiry-based experiences that take place during immersive events, they are experiencing similar emotions, successes, and frustrations to their students, which helps them make instructional decisions that stem from experience rather than theoretical understanding. The main learning outcome we have identified during this immersive experience is for teachers to begin making instructional changes that foster the positive experiences they and their students had while engaging with immersive scenarios.

Background

Immersive events are scenarios we created to simulate real-world occurrences that place teachers and students in the midst of a whole-school inquiry. Examples of immersive events we have facilitated include crashing a "meteorite" into a schoolyard, uncovering mastodon bones during routine maintenance in the schoolyard, or being called in after a janitor identifies an "unknown" biological hazard on school grounds. During these events, we spend one week at the school location and model inquiry for teachers as we solicit help from staff, faculty, and students in conducting investigations to learn more about the phenomenon. When facilitating these events, we do not tell students that the event is staged but simply

allow them to draw their own conclusions through the process of asking questions, conducting research, and engaging in investigations. Although we would never purposefully mislead students into thinking an event was real. The goal of these events is twofold: (1) to model student-centered, inquiry-based science instruction that does not rely on scripted curricula and, (2) to provide educative learning experiences that will help teachers feel comfortable with a more student-centered approach in their future science instruction.

Our Approach to Educative Experiences

Educative experiences for teachers have been defined as promoting teacher learning by placing them in the role of a learners and engaging them with curricula they will eventually facilitate in their own classrooms (Longhurst et al., 2016). Although educative learning experiences for teachers are not novel (e.g., Howes, 2008; Longhurst et al., 2016), our approach differs from other approaches to using educative experiences for PD.

We decided to approach educative experiences this way to prevent our work from becoming a one-shot PD that never comes to fruition (Lumpe, 2007). By immersing teachers in the event with students, they are able to see, hear, and feel an inquiry-based approach to science. Our intention is that an experience like this will become a concrete memory that teachers can draw upon when planning future science lessons. There is always the chance this does not occur, but we feel that taking this approach to educative experiences for teachers, at the very least, will help them have a positive experience with science instruction, which we still consider a success.

Planning for a Successful Event

Similar to extant literature (e.g., Wade-Jaimes et al., 2020), we have found that building strong partnerships with schools is essential for planning a successful event. With trends showing elementary teachers' strong reliance on science textbooks (Banilower, 2019), administrators have shared that they view immersive events as a unique and refreshing way to facilitate science instruction. However, this may result in administrators requesting that a scenario be facilitated at their school before speaking to teachers and ensuring that they agree to adapt their instruction for a full week.

The immersive events we facilitate are based on scenarios we designed that require a substantial amount of preliminary work concerning standards alignment and the formal development of Immersive Academics curricula. The instructional planning of these events begins with the creative consideration, "What resources do we have available that could create a simulated scientific phenomenon at a local school?" This thought process leads to ideas: "I have a boulder I could have delivered to a school that could be painted with

shimmery spray paint and surrounded by dry ice to simulate a meteorite strike,” which in turn begins the process of interdisciplinary unit planning in which we identify which science, social studies, math, English language arts, music, art, and PE standards could be incorporated. The identified standards are placed into a resource binder for teachers, which they will receive during the PD. This resource binder becomes a valuable tool that reduces the amount of work for teachers when finding ways to adapt their lessons to connect with the scenario. We also curate a series of lesson plans that we have written or found online and place them in a binder, which becomes the Immersive Academic curricula. We have found the development and dissemination of this collection to be instrumental in supporting teachers during the immersive week.

In the following sections, we provide details of our project in chronological order. First, we describe how these immersive events are initiated and how teachers are prepared for them. This is followed by details for each day of the weeklong events. Because our goal was to influence teacher instruction using an innovative approach, we conclude with feedback from teachers and implications for science teacher educators.

Preparing Teachers for the Event

Laying the Groundwork. The schools where we facilitate these immersive events are locations where the school administration or the school district have reached out to us expressing an interest in having one of the events take place on their campus. To initiate our work and spark interest and curiosity among the faculty, as well as identify unique aspects that are supportive of the learning community represented by the participating campus, we schedule a visit to occur during a regular faculty meeting. During this meeting, we introduce the immersive scenario and share a brief description of the forthcoming PD, details of what to expect during the immersive week, immersive week follow-up, and other essential details to ensure a successful immersive experience. Following this initial meeting, we often visit the school two or three more times for follow-up departmental, grade level, or specials area (e.g., art, music, or PE) group meetings to further determine needs and communicate more specific details of the immersive event experience. The goal of these visits is to develop the in-service teachers’ level of comfort in preparing for and implementing the immersive week.

Two to 6 weeks after that initial introduction, a 1-day formal PD is conducted on the elementary school campus or another location, such as a training room at the local school district office. We recognize that one-time PD has been found ineffective in transforming practice (Darling-Hammond et al., 2017); therefore, the goal of this formal PD day is not to result in an immediate transformation of practice but to provide teachers with the opportunity to engage in nature of science (NOS) activities aimed at reminding them of what it is like to engage in aspects of NOS (i.e., observations, empiricism, subjectivity) while also providing them with enough background and context surrounding the upcoming scenario that they feel

comfortable incorporating the scientific concepts into their regularly planned lessons. This PD day is only the beginning of the professional learning experiences these in-service teachers will engage with. Their professional learning continues throughout the weeklong immersive event through informal interactions as teachers observe how we engage students with science concepts through questioning and have the opportunity to facilitate questions and investigations with their students in and out of the classroom.

The formal PD day is a crucial component to the success of weeklong immersion because it provides the necessary background concerning the scenario and allows us to build a rapport with teachers, which is critical as we work with them and their students during the immersive week. The administration identifies a set of teachers to serve as grade-level or discipline leaders. The teachers who attend the PD are responsible for disseminating this information to their teams. They are expected to schedule a separate meeting with their faculty team members to distribute any training materials and information pertinent to the immersive event week. Funding for substitutes is provided from either allocated PD funds that have been preapproved by the administration or grant funds obtained by a local nonprofit education foundation. Administrators tend to select one or two teachers from each grade level and will sometimes select a specials-area teacher (e.g., art, music, or PE) to include all aspects of learning.

Professional Development Day. Educative curriculum is defined as materials designed to provide scaffolds for both student and teacher learning (Davis & Krajcik, 2005). Teacher scaffolds embedded within the curriculum often emphasize building the teacher's science content knowledge while also providing strong pedagogical support through explanations and suggestions for how to effectively enact lessons for the intended outcome (e.g., Brunner, 2019; Callahan et al., 2013). When teachers arrive for our formal PD day, they are provided with a binder (and digital copies) of the Immersive Academics curriculum, the set of resources mentioned in the planning section above. The contents of the binder include background information about the scenario and numerous standards-based, sample lesson plans designed for the specific immersive scenario (see Appendix). The sample lesson plans include explanations of content and the pedagogical strategies necessary for facilitating a successful week of interdisciplinary, inquiry-based learning.

The PD day typically opens with introductions and then a photo presentation of past immersive events on other school campuses. Photos are helpful in providing a contextual understanding of what to expect before the event kickoff.

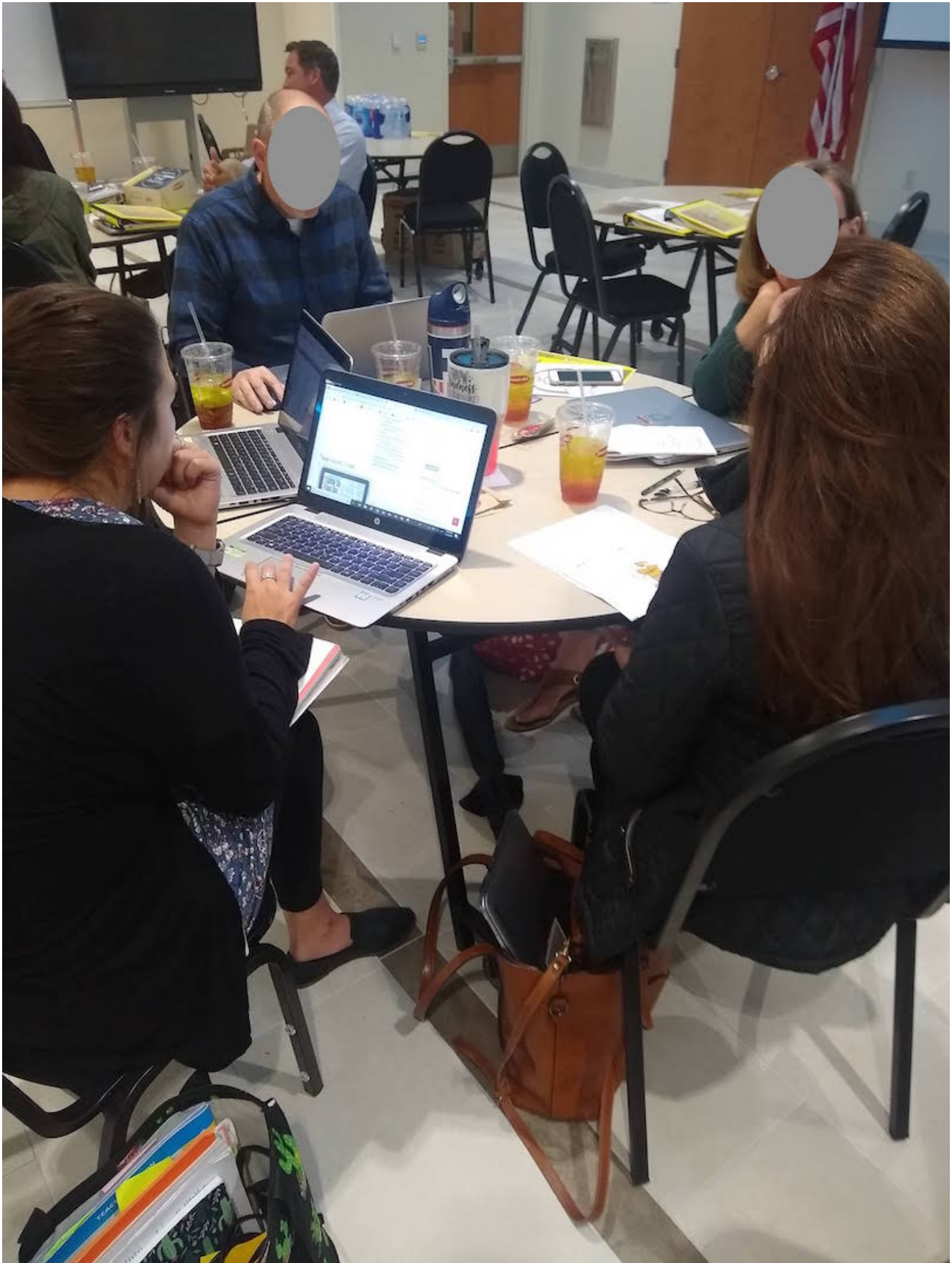
The next component of the day consists of NOS activities, such as NOS Tubes, The Great Fossil Find, and Tricky Tracks. Emphasizing NOS at the beginning of the day helps teachers get into the mindset of how to utilize the event to guide students in engaging with key aspects of science, such as making observations, using evidence to make predictions, understanding how to work collaboratively, and developing creative solutions to problems.

These activities also help us model the skills we hope to see teachers focusing on during the event. After these activities are finished, we guide a discussion of how to apply these process skills to daily science instruction.

These discussions provide a transition for the time following their participation in NOS activities. After lunch, teachers take the second half of the day to explore the resources binder, collaborating with their colleagues to develop a list of lesson ideas and materials they will need as they teach during the event week (Figure 1). We acknowledge that in-service teachers often lack time to engage with educative materials in a way that fosters confidence with implementation (Bodzin et al., 2012), so we commit to providing an adequate amount of time for teachers to explore the curriculum during this PD day. As teachers begin to collaborate, we visit the groups and help teachers find ways to tie the immersive event into their existing curriculum so that content delivered through the scenario does not add more work but instead provides a novel means of delivering the required or planned curriculum. Our support during this time acts as a scaffold as we model how teachers may use this anchoring experience as a guide when planning future interdisciplinary science instruction.

In the school district where this work has been done, teachers use a curriculum guide that maps the standards they are expected to teach throughout the year. As we circulate to the various groups of teachers, we refer to the list of standards and activities provided in the binder and their curriculum guides to help teachers identify themes that cross grade levels and curricular themes. Our past experiences with planning and facilitating these events allow these connections to come easily. While planning for curricula connections, teachers also take time to plan safety measures (i.e., ensuring that there will be an adequate number of adults to supervise students at the site during school hours).

Figure 1
Teachers Planning During Professional Development Day



From PD Day to Immersive Week. After the PD day, teachers are expected to meet with their colleagues who were not present and continue planning investigations, optimizing lessons provided in the Immersive Academics curriculum binders, or adapting existing lessons to conform to the theme chosen for the immersive week. The common planning is somewhat out of our control because the school or district administration is responsible for ensuring that teachers have time to meet for planning and sharing information about the immersive event. We have found that suggesting teachers use planning time to collaborate about the immersive week during the initial meeting with the administration, increases the scheduling support and encouragement teachers need to find this common planning time. On the first day of the event, we are able to recognize when this common planning time does not occur. In such cases, one of us will sit down with the teachers during that initial day to give them a brief overview of what to expect and offer additional support. Even when teachers arrive on that first day unsure of what to expect, our intervention allows them and their classes to fully participate in the experience.

The Weeklong Immersive Event

During this week-long immersion, our goal is to model for teachers how to ignite the natural curiosity of students, to allow teachers to observe the opportunities we provide for students to explore this curiosity through open-ended, inquiry-based experiences situated within the context of this simulated real-world event, and to provide opportunities for teachers to engage with open-ended, inquiry-based experiences as learners alongside their students. Through this process, we aim to provide teachers with an educative experience that is not only inspiring but also allows teachers to see what inquiry-based learning looks and feels like so they will have a mastery experience to draw from. As we considered the mastery experiences we were aiming for, we drew from Bandura's (1994) framework for self-efficacy, which defines mastery experiences as past experiences that initiate feelings of success or failure. The outcome we hope to achieve is to provide anchor experiences that will influence each teachers' future daily instructional practice to move away from scripted curricula and textbook-driven science.

Although we have facilitated many immersive events in schools, the most common three are summarized in Table 1. A full list of events with longer descriptions is found on the Immersive Academics website: <https://www.immersiveacademicsedu.com/scenarios>.

Table 1

Summary of Selected Immersive Events

	The Great Impact	Can You Dig It?	Outbreak
Description	A large foreign boulder has impacted school grounds. Students, faculty, and staff interact with “NASA scientists” and collaborate during inquiry-based activities throughout the week to determine the origin of this massive rock, identifying the likelihood of it being a meteorite.	During routine maintenance on school grounds, the custodial staff reveals a set of mastodon bones, which suspends the maintenance work, allowing students, faculty, and staff to interact with “archeologists” to further explore this discovery. This event initiates a week of excavation in search of artifacts and fossils, which require extensive research for identification.	An area of the school campus, something found on campus, or a set of projects built by students has become biologically contaminated, causing the area to be contained with caution tape and scientists in hazmat suits to be called in. Once the area is declared safe, students begin to conduct investigations, which lead to an understanding of the role of microorganisms, parasites, bacteria, and viruses as well as how bacteria and viruses spread.
Day 1	As students arrive on campus, they are greeted at the sight of the large “smoking” boulder (dry ice is used for this effect) and a team of NASA scientists (us) collecting data using instruments familiar to the school population (such as measuring tape and hand lenses). On this first day, students are excited and immediately begin asking questions, making observations, and developing predictions for where the boulder came from.	Students arrive on campus to discover a team of “archeologists” (us) using shovels and brushes to excavate bones and other artifacts that have been discovered. Students are curious about the findings on their school campus and begin asking questions and developing predictions about when and where the items originated from.	As students enter campus, they are drawn to an area that has been taped off where scientists dressed in full hazmat suits (us) are carefully collecting samples from a contaminated object. At first, students are apprehensive about approaching the site, worried they will become infected with something unless they are also wearing a suit, but after faculty and staff share that the area is safe, students are immediately intrigued with the events occurring in the contained area. Question and answer sessions with the scientists lead to a list of possibilities that will be explored throughout the week.
Days 2–4	Students and teachers interact with the potential meteorite while making measurements, digging for specimens, and recording observations in notebooks. We also set up stations where students are able to conduct self- and teacher-guided investigations related to the event, such as finding and breaking open geodes or using a hand lens to make close observations of different types of rocks.	Students and teachers return to the dig site where they engage in a question-and-answer session with the scientists and rotate through a series of stations that allow students to hone their observation and research skills as they examine other fossils, classify shark teeth, and read about prehistoric animals who lived in the area and may be the source of the bones.	Students and teachers revisit the containment site and participate in guided inquiry activities, such as a disease transmission activity utilizing glow-germ powder or a physical activity game where students problem-solve how to communicate under circumstances that create limitations, such as working as a scientist in a viral outbreak hot spot while wearing heavy protective equipment.
Day 5	The final day of the week is consistent across scenarios. On Day 5, we have the opportunity to visit classrooms and see the work students have completed throughout the week independent of their time at the event sites. Teachers sign up for a 30-minute time slot, and we visit each classroom. When we visit each classroom, we are welcomed with student presentations of what they have learned throughout the week or engage in a question and answer session with the class.		

Day 1. Each scenario begins with the initial day of discovery, which is often staged in a courtyard or high-traffic area of the campus. Students arrive on campus to “discover” the event, much in the way that real-world discovery transpires. The events typically begin on Monday, providing us the opportunity to stage the event after school on Friday or on Saturday, which includes digging a hole, creating impact streaks, delivering the foreign boulder, and putting up caution tape around the impact site to ensure student safety (Figure 2).

Figure 2
Staging the Boulder





When preparing teachers for the event, we communicate that Day 1, the day of discovery, is open-ended and driven by the students' curiosity. During the Great Impact event, we are often greeted by students with exclamations of "It's a crater! Look at the smoke!" or "I only saw these on TV. I didn't know these were real!" During a recent Can You Dig It? scenario, a student was in disbelief that bones were found on campus and questioned: "Did you put those in the hole?" During an Outbreak scenario, students were both curious and concerned as one student slowly approached and asked one of the scientists in a hazmat suit, "What happened here?" while another later questioned, "Is our city [referring to a model city they had built in class] okay?" To put the students at ease, we, along with their teachers, assure them that the hazmat suits were only a safety precaution because we did not know what to expect, but we have identified no threat after our initial investigations. This also serves as a teachable moment to share with students how important it is to take safety precautions while engaging in scientific investigations.

While the students are at the site asking the scenario scientists questions, one of us is in the crowd chatting with the teachers, gathering insight on their thoughts because this is the first time many are seeing the scenario in action. During these informal conversations, we will often ask the teachers questions. "What do you think about how the students are responding to this?" "Now that you see the immersion site, how do you think you might incorporate this into your teaching for the rest of the week?" The outcome we aim to achieve with these conversations is to help teachers recognize the natural curiosity that has taken over their students while helping them consider ways they can utilize this curiosity in their lessons.

When the regular school day begins, teachers bring their students out to the site during their scheduled time (Figure 3). The week before the event, we ask teachers to sign up for a 15-minute time slot to allow all classes to make initial observations and pose questions at the site.

Figure 3

Pre-Kindergarten Students and Teachers Observing the Potential Meteorite



Our dialogue with most students on Day 1 follows a similar pattern in which we build on their curiosity and challenge their thinking through lines of questioning such as, “What do you observe here,” “what do you think happened,” or “is there anything you think we might want to further investigate to draw some conclusions about this?” As teachers bring their students out to the discovery site and observe how we interact with students, we aim to provide an indirect line of support through our modeling of questioning. Feedback from teachers suggests that this first day is the most important in their development; when they experience

the scenario for the first time, the abstract begins to become a concrete reality. For instance, at the completion of the week during the Great Impact, one second-grade teacher reflected, “The first day was the most influential. It really showed me what to expect.” During the Outbreak scenario, a teacher shared, “I was excited for this but didn’t really know how to tie it into my lessons until the first day. Then it all began to make sense for how I can connect it to what we are already doing.”

Days 2–4. Similar to Day 1, teachers sign up for times to come out to the discovery site, but on Days 2–4, the time is extended to 30–45 min blocks. If teachers have specific topics they would like to emphasize during their visit on Days 2 or 3, we ask them to tell us at least a day in advance. Having knowledge of what topics teachers are teaching in the classroom allows us to provide more targeted scaffolding for teachers (Figure 4).

Figure 4

Teacher Observing Instructions Being Given to Students for an Inquiry-Based Lesson



For instance, at one school, a fourth-grade teacher shared that they were learning the different types of rocks. During their time at the Great Impact site, students recorded observations of the boulder that they later used during research time in the classroom to

draw conclusions concerning the type of rock it may be, including research on what type of rock a meteorite is, to help us determine the origin of the boulder. Our goal here was to show the teacher how to move away from the textbook and provide contextual learning experiences that students find meaningful. There will not always be a boulder on campus; however, there are usually rocks that students can bring back to the classroom and explore.

As the week goes on, teachers are expected to take over as facilitators. When teachers bring their classes out on Day 4, the roles of lead facilitator and supporting teacher shift, as we previously communicated during the PD. Teachers arrive at the discovery site with intentional activities that they plan and facilitate while we provide support through materials and answering questions (Figures 5 and 6). The activities that teachers plan are not submitted to us ahead of time unless the teacher wishes to have additional support that requires resources or planning. We do not want teachers to feel that we are checking their plans and aim to be viewed as a friendly support system. This transition of teachers independently planning and facilitating activities at the scenario site illustrates the implications for how these immersive events begin to influence the confidence and instructional practice of teachers.

Figure 5
A Teacher Helping a Student Make Observations



Figure 6
A Teacher Guiding Students Through an Investigation of Geodes



Day 5. On Day 5, we visit each classroom to see the work that students have completed outside of the event-site activities. During our visits, students often present projects they have been working on throughout the week. The opportunity to visit classrooms highlights how the PD day and educative event has begun to influence the instruction within each individual teacher's classroom. When we visit, we are often greeted by students who are eager to share how they applied their new knowledge by presenting research findings from the week (Figures 7 and 8) and how their discoveries have influenced their daily learning activities (Figures 9 and 10).

Figure 7
A Student's Backboard Research Project

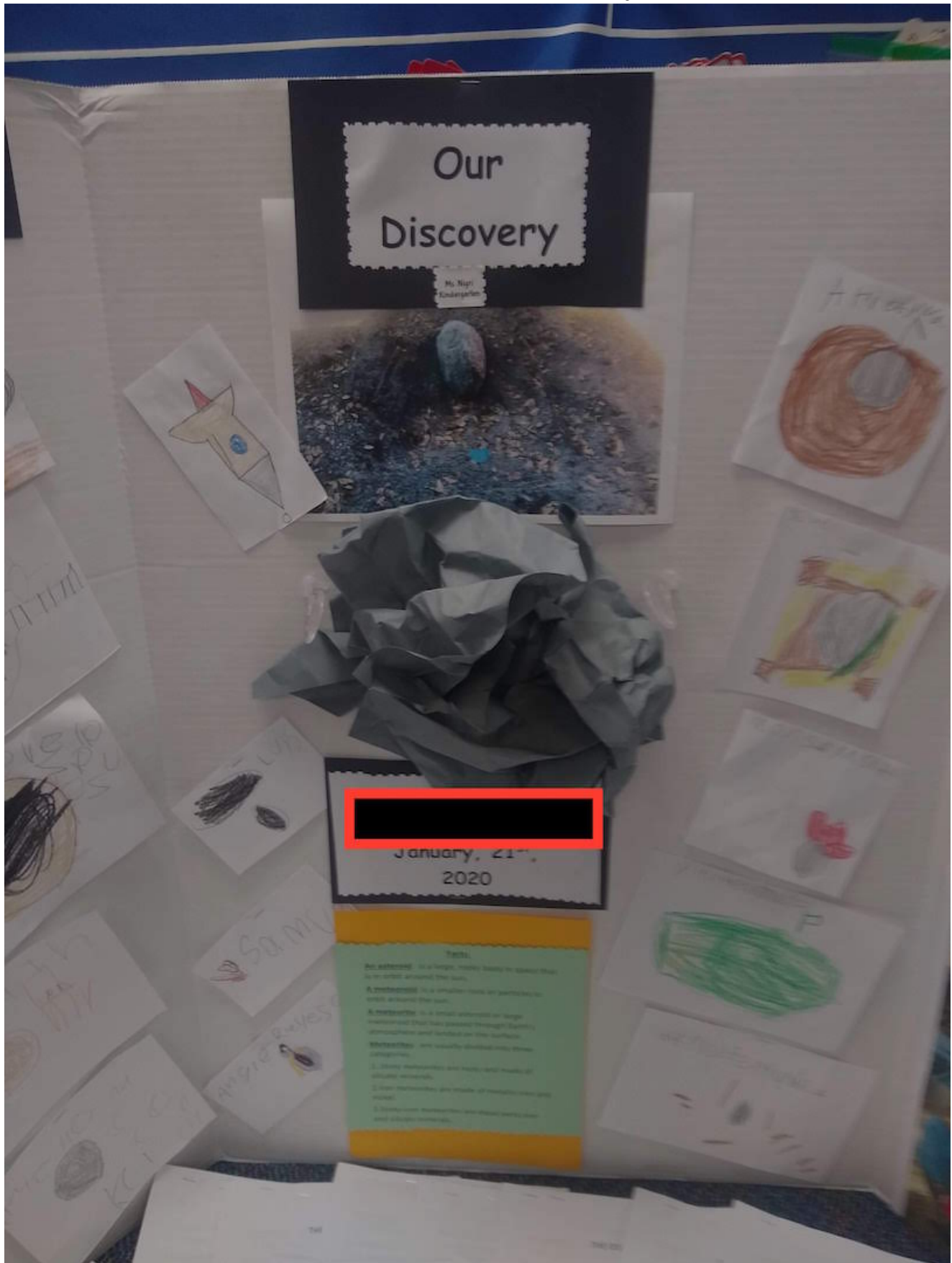


Figure 8
Students Presenting Their Research

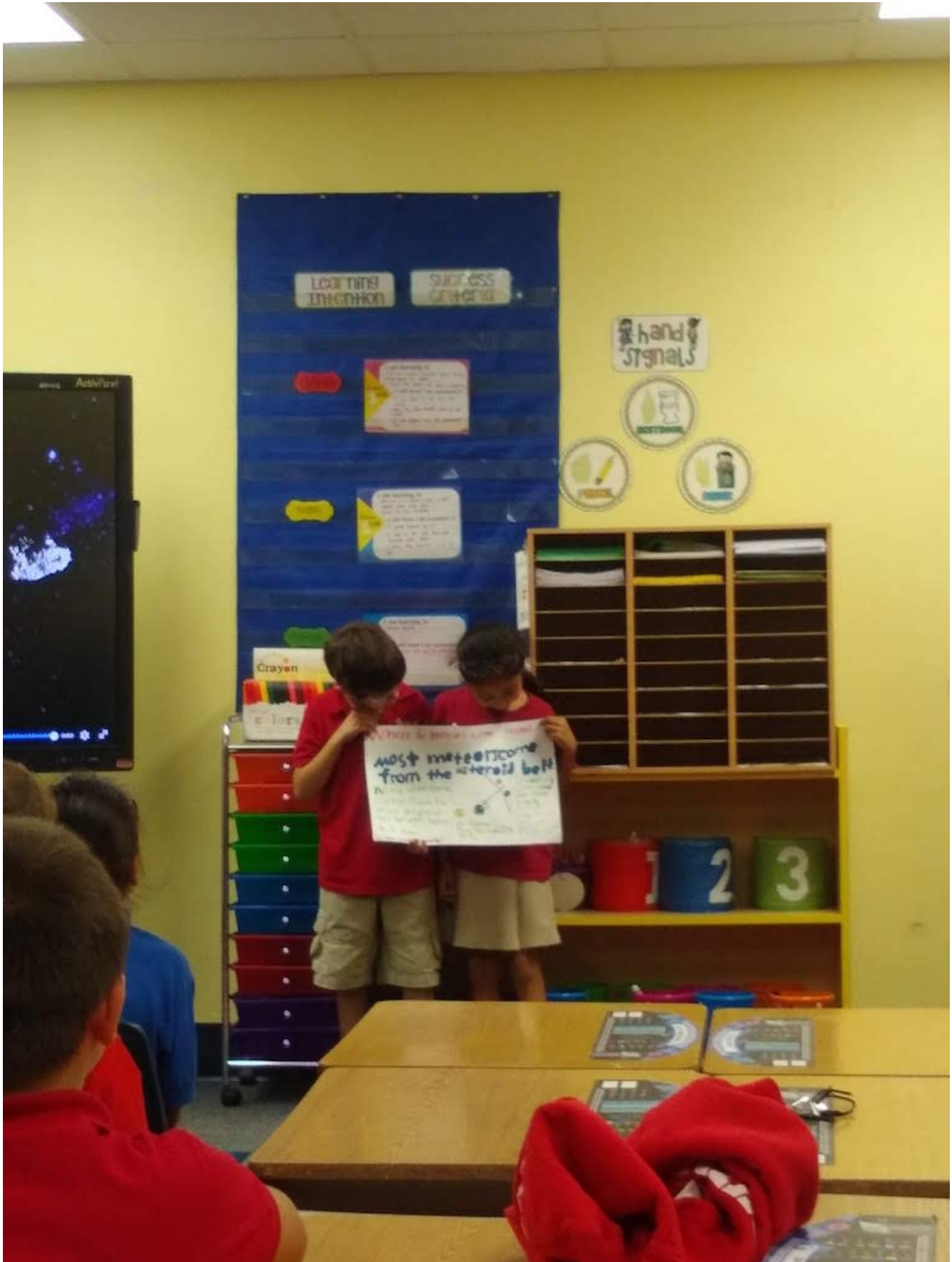


Figure 9

Interdisciplinary Learning: A Student's Creative Writing Assignment

METEOR WEEK REFLECTION

NAME

The meteor landing at our school this week was amazing!! I loved digging up rocks and dusting meteors.

My favorite part was meeting people from NASA! The meteor landed in the butterfly garden, and made a huge crater! Seeing something like this in person was astonishing! The scientists helped us identify types of rocks, and their names. This was the best week ever!! :)

Figure 10

Interdisciplinary Learning: Students Making Observations of Rocks While Using Them as Counters in Math



Engaging students in real-world simulations through inquiry, such as these immersive events, has been shown to deepen their understanding of science content while also enhancing their interest in scientific concepts (McCormick, 2019). During our conversations with students on this final day, it is not uncommon to learn how this experience provided opportunities to hone investigative scientific process skills and develop a healthy sense of skepticism. For instance, some sample quotes we collected during a recent Great Impact scenario include one third-grade student who shared, “I did some research. The crater isn’t big enough to be a real meteorite.” In another classroom of fourth- and fifth-grade students, one student stated, “It’s fake. I did research and saw a basketball size meteorite would create a larger crater. I also saw that meteorites are black with little holes, and this one isn’t.” Another student shared how their research-based investigations prove this was not a meteorite: “I think it’s fake because I learned that meteorites are magnetic, and this one isn’t magnetic.”

Teacher Feedback

Due to the nature of the event, our data consists of informal interviews with teachers that occurred at the event site throughout the week. Our goals in conducting these interviews were to gain feedback concerning: (1) teachers' preparation for the event and (2) how the events may influence change to future instructional practice. Examples of some possible questions throughout the week are found in Table 2.

Table 2
Semistructured Interview Questions

Timeframe	Questions
Beginning of the week	• How were you prepared for this week? • Do you feel prepared for the event? • How will you use the event to support your lessons for the week?
Middle of the week	• How is the week going so far?
End of the week	• How did the week go? • In hindsight, were you prepared for the week? What would you need us to do differently? • Do you see your science instruction changing at all based on this experience?

Preparation. On the first day of the event, we informally interviewed teachers about their preparation when they came out to the site. The feedback we received from those who attended the PD day was positive. For example, one fourth-grade teacher shared the following about the Can You Dig It? event: “I feel very prepared for the week. After you came to the school, we had a team planning meeting, and we plan to do geodes as a review from rock types, and we are also working on measurement, so anything students find at the site will be measured and compared.” Another teacher, who teaches third grade, explained, “Once we knew who the rep would be for our team, we met and brainstormed before the PD. We have plans for the week to focus on fossils, classifying and labeling, and area and perimeter in math, but having the whole team there would have been better for collaboration.” This was helpful feedback for us moving forward when we make suggestions to future schools regarding what has and has not worked in the past. The idea of meeting as a team prior to the PD day was interesting.

In addition to how the teachers who attended the PD felt, we wanted to see how the information shared during the PD influenced the teachers who did not attend. Overall, we found that team planning meetings were referenced as helpful when passing information about the event forward. During the Great Impact, we learned from one second-grade teacher, “I feel ready. We team planned during our PLC [professional learning community] for this week. We are going to make observations and focus on what scientists do.” A second-grade teacher expressed something similar during the Can You Dig It? scenario: “Things were successful. We had team planning in PLC [professional learning community] to plan for this week.” Another teacher, however, wished she had been given the opportunity to attend. A pre-Kindergarten teacher who participated in the Great Impact shared, “I did not go to the PD, but I think it would have been better if I did. I heard about it from my team, but I would have liked to hear about the event from the sources. I also would have liked time to build my students’ background knowledge before this week, but I guess they got the element of surprise, but I wasn’t able to build on it right away, and if I went to the PD, I could have planned for that.”

Student Learning. With an overarching goal of helping teachers plan science instruction that fosters a positive experience for students, we decided to specifically ask teachers about their students’ learning. When we asked teachers about their experiences with the Great Impact immersive event, one fifth-grade teacher specifically referenced the interdisciplinary benefits of the week:

It was fun to watch the confidence of the students go up as they made connections. Students were confident with content in science, which was great. One student asked, “Why are we doing science in math?” and I said, because this is how we use science in real life.

Similarly, a second-grade teacher shared, “Students are reading about the killer asteroid. Students have been doing research on YouTube and watching videos about asteroids and meteors. I’m seeing my students connecting this event to the reading, and it helps with their comprehension.” These pieces of evidence show promise for how this event may influence teachers to take a more interdisciplinary approach in future science instruction.

During our interviews, teachers also referenced nonacademic influences the event had on students. During a different immersive event, Outbreak, a teacher referenced student engagement improving during the week and their desire to continue visiting the site to collect data: “I didn’t want to bring the kids out again, but they were dying to come out here and do more.” During the Great Impact event, a fifth-grade teacher shared, “They’ve been bringing their own rocks in from home all week, and one student told me this made them love space again. It’s been great.”

Future Instruction. At the completion of the week-long events, we asked teachers about their overall experience and if the event would have any influence on their future instruction. After the Great Impact event, one third-grade teacher shared, “This showed me that this isn’t scary, immersion isn’t scary,” indicating that the week dispelled some of her fears concerning interdisciplinary, inquiry-based instruction that immerses students into the content. In addition to addressing fears about pedagogy, the event also positively influenced perceptions of student abilities. One kindergarten teacher explained, “During the PD, I was concerned about my kindergarten class and how we would fit it in,” but added that the event has provided a foundation from which she could build for future science instruction: “This will give my students the ability to apply and comprehend science, so I’ll refer back to this experience throughout the year.” When asked if the event will have an influence on her future instruction, a second-grade teacher mentioned how the time to collaborate and make cross-curricular connections during the PD has helped her learn to teach science through other subjects: “Oh yeah! I’m better at connecting ELA to science now and plan to supplement my reading with hands-on activities to increase their comprehension.”

After the Can You Dig It? scenario, two teachers expressed how this week will influence their daily instruction. A first-grade teacher explained, “This was great! I need to find ways to keep doing things like this (inquiry-based instruction)!” Similarly, a second-grade teacher shared, “This will definitely impact my science instruction. I’m going to start doing more hands-on because the kids love it.” After bringing her class out to the dig site during a Can You Dig It? scenario, one teacher was so encouraged by what her students experienced that she began to brainstorm with another teacher about locations for a permanent dig site on the school’s campus. She suggested, “We have this empty grass lot near the cafeteria. I wonder if they would let us dig it up and keep it like that so we could use it to stimulate interest,” adding, “We could just bury anything in it to get the students excited,” as she laughed.

Implications

Elementary teachers are often reluctant to engage children in challenging science content due to concerns that it will be too difficult for them (Roth, 2014). Based on teacher feedback, however, these immersive events allow teachers to see firsthand the cognitive capabilities of their students. This has inspired many of the teachers we worked with to continue engaging their students in similar formats of science instruction.

Although these large-scale immersive events may not be feasible for everyone, facilitating smaller inquiry-based events for the purpose of providing educative experiences for teachers is an innovative practice that we hope begins to emerge more frequently. Based on our collective experience and the evidenced conversations with teachers and staff, we believe the key to success with this model of immersive inquiry is that it cultivates collaborative and discipline-inclusive approaches conducive to the goals of science education. Therefore,

science teacher educators who do not work with entire schools but with relatively small teams of teachers can guide them through a similar process where everyone collaborates to make sense of scientific phenomena. Those who wish to consider how a sociocultural approach in terms of teaching not only science but also transdisciplinary topics influences teachers' future science instruction should consider the notion of immersive academic events.

Supplemental Files

[Appendix.docx](#)

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