Exploring Practices on the Move: Facilitating Learning Across a Neighborhood

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Abstract: As scholars conceive of learning as connected across time, space, and social structures of participation, new questions arise about how to better coordinate learning experiences along those dimensions. In this study, we leverage a design experiment developed with two low-income neighborhoods, to facilitate science learning across the everyday settings of these communities. We focus our analysis here, on how different actors facilitated a common practice that arose organically—probing learners for their understanding—and how that practice moved across different social and material configurations of the neighborhoods. As this practice was taken up by different actors—teachers, parents, and others—we observed the different variations of this practice that learners may experience. By understanding practices on the move, we argue that smart and connected learning ecosystems will require more nuanced noticing, coordination, and layering of different flavors of a practice that can be taken up by a network of actors.

Introduction

Learning is increasingly seen by scholars and practitioners as connected across time, space, and informal and formal settings (Ito et al., 2013; Kumpulainen & Sefton-Green, 2014). From this framing, new questions arise about how to better coordinate learning experiences on the move. The idea of movement can take different forms. For example, first, one might start with the notion of a setting such as a classroom versus an after-school program and note the different learning practices that can be facilitated or experienced across those settings. Education research has a long history of studying a single place as a site of learning and comparing across places (Leander, Phillips, & Taylor, 2010). One might also consider settings that blend diverse values, practices, and goals to create hybrid spaces that can be more inclusive for learners (Calabrese Barton & Tan, 2009). An analytical choice to examine learning across settings attunes one to the features of settings and the distribution of resources and practices across settings in comparison to one another. Second, movement might focus on an individual, following them as they move through time, to different settings, and experiencing different material resources, interactions, social relations and power structures (Bell, Tzou, Bricker, & Baines, 2013). A focus on an individual moving through space, time, and social and cultural structures then, brings attention to the developmental trajectories of learners.

In the following paper, we articulate how recent scholarship has conceived of learning as connected and on the move through lenses such as the above. We then focus on a third possible lens, examining a *practice* as it moves across people, settings, time, and social and cultural structures (Kumpulainen & Sefton-Green, 2014; Leander et al., 2010). Our context is a broader research project called Science Everywhere (SE) where we purposefully co-designed neighborhood ecosystems of informal learning programs, classrooms, and institutions like the local church, with the goal of connecting science learning across contexts for young people (Ahn et al., 2016). In this connected learning context, we were able to collect observations, recordings, and interactions of learning practices as they occurred across different settings in the neighborhood, enacted by various actors and learners, and in different times and situations. We focus on one practice in the initial analysis presented in this paper—how different actors probed young learners for their science understanding—and trace the nuanced flavors of that practice as it was taken up in these different situations.

Specifically, we look at how this practice can be taken up by a network of actors, buttressed by diverse social and material resources, morphed into different forms, and layered over time. This lens then attunes us to rethink the goal of coordinating, or connecting learning, for learners. In addition to providing learners with access to a wider variety of learning situations (a focus on place), or helping broker connections between spaces (a focus on person moving through places), we might also think of coordination as ensuring that learners encounter the

full range of a learning experiences or interactions that are possible. Coordination may then mean distributing and providing access to all the flavors of a practice across entire neighborhood ecosystems, and not seeing one place or person as responsible for facilitating a given learning experience.

Theoretical framework

In the study of how learning connects across time, space, and settings, researchers take different analytical lenses that illuminate different facets of the process. A common perspective is to examine learning in a contained place such as a formal classroom, informal learning setting such as a library, or an online site such as an affinity space (Gee & Hayes, 2012; Leander et al., 2010; Pinkard & Austin, 2010; Subramaniam, Ahn, Fleischmann, & Druin, 2012). Such an orientation attunes us to examine the features of a place and how learning interaction, discourse, or participation comes to be there. The resulting implications then focus on how one might design and structure a place to facilitate deeper forms of learning and interaction, and how we might provide access to diverse places of learning for learners.

However, individuals bring their past experiences, present goals and actions, and future imaginations to bear in a given learning activity (Brown & Renshaw, 2006; Polman & Miller, 2010). This realization begins to orient us to understand how a person moves across experiences, and develops their learning trajectory along the way. This orientation follows a learner through their experiences over time. Scholars have begun to theorize how learners move through different structures of participation. They meet different people along the way, experience learning settings that have different materials and activities, and face different power dynamics where they may be valued in one setting and devalued in others (Bell et al., 2013; Calabrese Barton et al., 2013). This viewpoint starts to enrich our understanding of learning on the move. Not only must we create diverse places of learning that a learner different and rich learning experiences, but we must also figure how to broker and point a learner to a next opportunity in their trajectory (Ching, Santo, Hoadley, & Peppler, 2015).

Finally, we forward a different lens in the following study. Instead of a single place as the focus of analysis, or a learner moving through space and time, we sought to understand how a *learning practice* could be taken up and coordinated across multiple spaces, people, and situations. Kumpulainen and Sefton-Green (2014) highlight the idea of a chronotope, which is a socially constructed practice that evolves as people make sense of their past, present, and future. Thus, when a researcher observes how students interact with each other in a classroom setting, they can see how the students' pasts interact with their current interaction or participation, and can relate to their potential practices in the future (Brown & Renshaw, 2006).

In this study, we leveraged a context—two neighborhoods (detailed below)—where we were able to observe several learning settings, neighborhood residents and children (who were present across contexts), and the learning interactions that occurred across time, configurations of materials, and combinations of people. From this larger corpus, we were interested in following a chronotope—a practice—as it manifested across these social and material settings. Specifically, we pulled out a common practice that arose organically in our neighborhoods. We noticed that many different actors (e.g. teachers, informal educators, parents, pastors and others) engaged in questioning behaviors that probed young learners for their understanding of science. However, by looking at this common practice as it moved across people, settings, time, and events, we were able to appreciate the nuanced flavors of that practice, or how different actors took questioning up. Then, as a whole, we foregrounded how layers of questioning can develop different ways for learners to engage in explaining their thinking and connecting with science across their neighborhood. We took up two exploratory research questions from this idea:

1. How did different actors in a neighborhood probe young learners for their understanding across different situations?
2. Were there diverse features of that probing for understanding practice, as it took place across the neighborhoods?

Methods

Context

All names are pseudonyms in this paper. The context of this study occurred in two neighborhoods: Rockdale (Northeast USA) and Susquehanna (Pacific Northwest USA) where we co-designed neighborhood ecosystems of learning, often taking the role of facilitators. In both neighborhoods, we partnered with institutions such as local schools, churches, and afterschool programs, and then engaged cohorts of young learners across those settings. A major component of our design-experiment was to develop technologies that helped connect learners across these settings. For example, learners shared their everyday science experiences using a social media app that we developed for the project. In addition, we designed large, tangible public displays that were placed across the

neighborhood settings, that made parents, educators, peers, and other neighborhood members aware of the activities that were occurring across the neighborhood (Yip et al., 2016).

Both neighborhoods have Title I schools that serve communities from predominantly lower socioeconomic families. In Rockdale, we worked with Grace Covenant Church, a religious organization that hosts various learning programs (including SE, our own afterschool science learning) within a two-mile radius of our partner school, Westland Middle School. At Susquehanna, we ran afterschool programs, summer programs, and informal family gathering for science learning at Soaring Eagle Middle School. We also worked with Mr. McDonald, a science teacher at Soaring Eagle Middle School. At both sites, Science Everywhere includes hands-on learning activities such as food experiments and engineering projects. In this context, we were able to follow learners as they moved across learning experiences. For the analysis presented here, we were also able to observe and draw out common learning facilitation practices that different actors in the neighborhood enacted across these settings.

Data collection and analysis

Data for this paper is drawn from a larger corpus consisting of field notes (92 pages), videos and audio recordings (59 hours), interviews (22), and application logs (over 4,000 posts). First, in each context, the research team made observations and wrote up field notes and analytic memos. Second, in Susquehanna, we video recorded interactions in afterschool programs (single camera), classrooms (multiple cameras), and informal family science gatherings (multiple cameras). In Rockdale, we video recorded science activities at Grace Covenant Church and placed audio recorders the public, interactive displays. Third, we examine application logs from our social media app that include pictures, timestamps, and textual posts. Finally, we interviewed 12 parents, youth, teachers, and community members across both Rockdale and Susquehanna neighborhoods. We asked questions about participants' engagement in their communities, the science activities, and their interactions with our technologies. From our larger corpus of data, we focused narrowly on interactions that we observed and recorded between learners and different actors across the neighborhood. We transcribed these interactions and synthesized important aspects of community interactions and learning practices as they unfolded across time and space. One prominent practice occurred when an adult would question and probe a learner's understanding around a topic or activity. Thus, for our initial analysis in this paper, we pulled out the transcripts of that particular practice from our larger corpus of data, selecting only interactions where clear video or audio files were available, which resulted in 12 interactions. To represent the richness and range within of our data corpus, we purposefully selected interactions that spanned across our study settings, locations, time, and individuals. While all 12 interactions were analyzed, we only reproduce snippets of 6 to demonstrate our findings. For the corpus of video and interview transcriptions, we created inductive codes to organize the data based on different ways in which learners, facilitators, teachers, community members, and parents interacted with each other, the context that surrounded them (e.g., informal learning, formal learning, community event), and their practices (e.g., socializing, questioning and inquiring, and brokering connections). In order to understand the practice enacted in each selected interaction, we drew upon our understanding of the larger context where they developed. In other words, we did not examine the interactions in isolation but also considered each person's position within the setting, the activities being carried out, and the social context surrounding them.

Findings

We observed two types of probing for understanding—confirmatory and explanatory—each with a different way of moving through contexts, people, time, and space. We use the term *enactor* throughout the findings to refer to different adults who interacted with a learner in a given situation. Enactors included teachers, researchers, community members, and parents. We use the common term for all these cases to reinforce our focus on the practice they enact as opposed to their positionality within the interaction. Additionally, we've emboldened parts of each interaction to show how they illustrate their respective type of probing.

Confirmatory probing

This type of probing consisted of adults checking to see if their statements were being understood during an explanation or observation. Specifically, adults probed for understanding in a confirmatory way by introducing short questions after their statements and sought agreement or a fixed answer from a learner. These questions usually included an affirmative word (e.g., "right") added at the end of statements. Below, we show three examples of confirmatory probing that illustrate the practice and analyze how confirmatory probing moves across adults, settings, space, and time.

Example 1: Facilitator with learner in front of large interactive display. Our first example involved a facilitator (Tanya) who was also a community member and researcher in Rockdale. The child involved

(Sebastian, 8 years old) had only been attending SE at Rockdale for a few sessions, so Tanya was showing him the SE application on the large interactive display. Throughout the interaction, the facilitator referenced content on the screen while she talked. This informal conversation was not part of a structured activity. Instead, Tanya was having a one-on-one interaction with Sebastian in the hallway, where the screen is installed:

Tanya:	And so, what you can do is, you can take pictures… **right?** And you can write something under it. And you can share whatever you're doing; it can be at home… like, you can post from home, you can post from school, you know how do you wanna use this at school, **okay?**
Sebastian:	Ah [as in understanding].
Tanya:	So, like, let's look at it and see some ways that some other people have used it, **okay?** So, what did we do here, this is when we were doing our... what?
Sebastian:	Our (inaudible)
Tanya:	And what did we do with it?
Sebastian:	Uh... we shared it
Tanya:	Mhmm, we took pictures, **right?**
Sebastian:	Yeah.
Tanya:	We took pictures before and after, **right?** … And what else? We had here, when we had the concert people were sharing that, **right?**

Example 2: Teacher with learner who made a post. The following interaction took place in a science 8th grade classroom in Soaring Eagle Middle School. Mr. McDonald set-up an activity where students worked in groups to analyze numerical data related to environmental science and wrote down their conclusions from that data. The teacher asked students to share their thoughts by posting them to the Science Everywhere app, to which all students had access, and an interactive display placed at the front of the classroom where the teacher could review posts. In this example, Mr. McDonald is walking around the room, talking to groups about their posts and asking further questions to a student (Ana):

Mr. McDonald:	[Reading a student's post] "So, overall the weather-" wait, "the *weather* in the U.S. is increasing" … what does it mean for the weather to increase?
Ana:	It's getting hotter!
Mr. McDonald:	It's the *temperature* that's increasing… Temperature and weather are not the same thing… **alright?**

Example 3: Mother with daughter playing with slinky. The following example takes place at an afterschool informal learning session called Family Science Night, where parents and relatives are invited to participate with their children in the programmed activities. For this session, facilitators had laid out multiple materials to explore the concept of *waves* without asking participants or their family members to follow any specific instructions. Therefore, this specific interaction did not stem from a structured activity, but emerged naturally from a mother (Susan) and her middle-school aged child (Christina) interacting with the available materials. In this case, Susan is confirming whether Christina is noticing the same phenomenon that she is observing by attaching confirmatory questions to her observations:

[Susan and Christina are playing by extending a slinky over 12 feet and creating waves on each side by tapping or hitting the end of the slinky. Both Susan and Christina shake the slinky and the waves meet in the middle]

Susan:	Oh, look! It bounced back, it bounced back and went boom-boom. You can see it, **right?** Do it again. [Both shake the slinky] **See?** Boom.

Movement across settings and enactors

Confirmatory probing moved across contexts and enactors in a seamless manner. We found similar instances of this practice in numerous occasions throughout multiple settings. While the content or topic being discussed varied across interactions (from a discussion about a tool to environmental science to waves), the enactment of this practice by the adults remained quite stable. Moreover, these examples of confirmatory probing elicited similar

responses from the learners, who usually confirmed understanding through a verbal expression (e.g., "Mhmm" or "Yeah") or a gesture (like nodding).

Movement through time

Akin to the stability of confirmatory probing across settings and enactors, we found the practice to have a similar role through *time* in different settings. Confirmatory probing usually preceded a different type of probing for understanding; explanatory probing (see below). Confirmatory probing was enacted during initial explanations or quick clarifications of knowledge that would be probed for in the future. For instance, in Example 1, after Tanya made sure that Sebastian was following along, she asked him to explicitly show his understanding ("And what did we do with it?"). In Example 2, Mr. McDonald confirmed that a student understood temperature and weather as different concepts, a piece of knowledge that had to be properly included later in student-led class presentations.

Explanatory probing

Explanatory probing consisted of prompting for an explanation or demonstration of knowledge from the child. As opposed to confirmatory probing, this type of practice did not involve adults explaining concepts or making observations. Instead, enactors asked children to show how they had acquired relevant concepts by including those concepts in their own explanations of phenomena or by correctly answering structured questions. However, our analysis also includes instances where the answer was co-constructed between enactors and learners. Below, we provide three examples of explanatory probing that demonstrate the practice's variability. Then, we compare them by focusing on how the practice moved across people, settings, time, and space.

Example 4: Facilitator asking why a circuit works. In this fourth example, a facilitator and researcher (Justin) reacted when a child (Eric) who had successfully completed a task yelled in excitement. The interaction took place in an informal learning session in the summer in Susquehanna. The children were tasked to create their own circuits with conductive tape, a battery, and a small LED light. While each child was given materials to work independently, they were arranged in tables of four in the room. This interaction began when Justin heard Eric's excited utterance and approached the table where he was sitting with three other peers (including Amy) who were working on the same activity.

Eric:	Yeah, I did it!
Justin:	[Walking over to table] You got it to work?
Eric:	I did it! Boom!
Justin:	Let's see… boom! [goes to the side of child, pulls a chair from an empty table, and sits next to him] Okay so how does- **how does it work? Tell me how it works.**
Eric:	So- so, the bottom is the negative.
Justin:	The bottom's the negative.
Eric:	The top is the positive.
Justin:	The top is the positive, okay.
Eric:	The top needs to go all the way here to get to there [pointing at his circuit]
Justin:	What did we say with the flow of electrons? **What direction does it go?**
Eric:	Uh... [hesitates, his eyes leave the circuit and he looks up, smiling]
Amy:	[From across the table] It goes to the positive, right?
Justin:	[Calmly, redirecting his gaze to Eric] It goes from negative to positive.

Example 5: Teacher giving guidelines for student presentations. Our fifth example shows Mr. McDonald at Soaring Eagle Middle School introducing the format he expected to see during student presentations. These instructions were given from the front of the room, while the students sat closely as an audience. The presentations this teacher referenced were set for the end of the class, after the students analyzed different graphs and made conclusions from quantitative data. The interaction transcribed shows how the format of the student's presentation matched Mr. McDonald's modeling and criteria:

Mr. McDonald:	Real quick, the presenter **is going to be sharing:** the title of the data, the context, and, I'll actually write this down on the side, so we have it up while we're looking at it [writes "title" and "context" on whiteboard]. So, we have

the title, we have the context, so, that's that stuff at the beginning, we're talking about: what is being measured? So, basically, if you were looking at this [holds a paper with a bar graph up], **you'd be saying**, "okay, in this, the bars are showing how much area was covered by ice in the lakes, and this is the years". Just to give us a quick context; what is your graph all about? **You're also going to share** your "summary statement" (. . .) and then the last is your "possible cause" (. . .)

Cynthia: [Presenting] The title is "Global average sea level change" and it's like, measuring how much the sea level has risen [makes an upward motion with right hand] over the years. [Looks at board] And, the sea level has risen ten inches over the 145 years, and we said like, the cause-effect is that humans, we make a lot of products and then that CO_2 [makes a convoluted gesture, like things mixing] it traps like the thermal energy, making the Earth warm, warmer. And then the ice melts and it goes in- it turns into water and then goes into the sea which makes the sea rise.

Example 6: Pastor asking child questions about his paper airplane design. The sixth example shows the pastor of Grace Covenant Church, Pastor Martin, acting as a facilitator. The interaction took place during an informal learning session in Rockdale where the activity was set for children to create their own paper airplanes to begin investigating the principles of aviation. In this case, Pastor Martin was trying to get a child's (Brandon) attention, asking questions to guide his design, and providing help in answering those questions:

Pastor Martin: Brandon… **What are you doing?** How are you trying to lay it? What's it going to do? … Your goals, what's the goals? Is it gonna go far? Long? Do tricks? **What's it going to do?**

Brandon Long

Pastor Martin: **How are you going to make sure it does that?** … you have to make sure you consider that when you design it.

Brandon [Nodding]

Pastor Martin: So, if we look at [points at other side of room] what people have already done, then we can figure that out. (. . . another child attempts to fly her plane, which does a loop in the air and falls quickly). **Why do you think it did that?** … My guess is because of these [points at post-its attached to the paper airplane]

While some of these examples of explanatory probing may resemble confirmatory probing in that enactors provide a partial explanation of important concepts, their main difference lies in the response expected from the children in the interaction. In confirmatory probing, enactors expect only a confirmation that their point is being followed or a factual answer. In examples of explanatory probing, enactors expected the children to *show* that the concept was understood by properly including it within a given structure.

Movement across enactors

Explanatory probing moved across enactors by changing in form and in the type of learning opportunity it created. For example, some enactors probed for understanding by asking for explanations from the children and then participating in co-constructing that explanation (Examples 4 and 6). But, even within these cases, enactors positioned themselves differently during co-construction. While Justin guided the explanation by repeating correct statements and making open-ended questions from a position of knowledge, Martin asked a series of targeted questions and positioned himself as a co-learner to answer his own questions ("we can figure that out").

On the other hand, Example 5 shows how explanatory probing moved across yet another facilitator—Mr. McDonald. In this case, the teacher creates a clear expectation for the type of demonstration that he wishes to see. While, like in Example 4, Mr. McDonald is looking for a full-fledged explanation of the content, his focus is not on the accuracy of the understanding but on the practice of the presentation of scientific findings.

Movement across contexts

Our analysis shows that explanatory probing moved across contexts in a marked way. Particularly, some settings showed a personal and unstructured flavor of explanatory probing while others showed a more public and

structured form. When explanatory probing was enacted in an informal learning setting (like the SE sessions in Rockdale and Susquehanna), enactors probed at a personal level, usually in a one-to-one conversation with the learner. Although sometimes those near the interaction offered suggestions, enactors did not ask for the whole room's attention nor did they redirect other children to the interaction with the target learner. Enactors in these settings also provided a loose structure for the child's responses. They either asked a very general question (e.g., "why does this work?") or provided a plethora of questions that the child could address (Example 6). This type of personal and unconstrained enactment allowed for children to develop their explanations in a conversational way, often asking questions within their responses and using peer suggestions to elaborate on their answers.

On the other hand, explanatory probing in formal settings was enacted through a clear structure. Teachers in our sample interactions used different methods to ask questions that demanded a specific type of explanation. For instance, when Mr. McDonald asked children to present their findings, he did so by providing clear points that had to be addressed during those demonstrations. This structure elicited carefully thought-out responses that did not contain additional questions as they were expected to be fully developed before they were presented. Additionally, explanatory probing in formal settings was usually enacted in a public manner. Children were expected to create responses that could be examined by the rest of the class either through an application available to all or through a presentation where all peers (and the teacher) participated as the audience. The way explanatory probing moved across formal and informal settings suggests that, while all enactors effectively probed for understanding, the specific form of their enactment of that practice affected the types of responses they elicited from the learners, and therefore the learning experience they created.

Movement across space

Within a given context, we found explanatory probing to move across physical space. This movement usually marked a switch in probing practice subtype. For example, Justin was walking around the classroom and, after hearing Eric had completed the task, prepared to probe in an explicit way by grabbing a chair and pulling it next to the learner (Example 4). Once Justin was sitting at the same level than the learner, he probed: "How does it work? Tell me how it works". In a similar way, Mr. McDonald rearranged the physical space of the classroom in preparation for explanatory probing. Before asking students to begin with their presentations, he asked the class to gather by the whiteboard, pulled a chair, and sat next to the students that were not presenting. In this way, Mr. McDonald moved down to their physical level and became one of the audience.

Taken together, these examples suggest that explanatory probing moved through physical space by leveling the enactors with the learners. Whether it is by sitting next to them or participating as a member of the audience, enactors took a secondary role in the space of the room before enacting explanatory probing. We do not have evidence to suggest this movement was purposeful, but it may respond to the intention of giving the learners a principal role during explanatory probing.

Movement through time

Previously, we suggested that confirmatory probing preceded other forms of probing for understanding. Explanatory probing, on the other hand, moved through time by coming *after* other facilitation techniques, such as adult explanations, activities aimed at developing understanding, and confirmatory probing. The understanding expected to be demonstrated was usually around concepts recently acquired. In Example 4, Justin probed for Eric's knowledge that was used to create a circuit only seconds before. In Example 5, Mr. McDonald expected a demonstration of the work the students had done in the last two days. In the final example, Martin referenced design knowledge that had been addressed previously within the same informal learning session.

Conclusion, implications, and limitations

Our analysis suggests that the practice of probing for understanding can take multiple forms as it moves across learning settings, enactors, space, and time. Specifically, we noticed how a subtype of probing for understanding—confirmatory probing—remained similar in multiple scenarios and produced a consistent type of response. On the other hand, our analysis of explanatory probing across situations allowed us to make more nuanced distinctions of the different flavors that comprise the practice. For example, Justin used explanatory probing as a way of providing a space for the learner to have more agency over his learning by allowing Eric to create his own explanation. However, Justin maintained a position of knowledge and facilitated Eric's explanation by providing guidance and asking questions to direct it. On the other hand, Mr. McDonald's enactment of explanatory probing created a different educator-learner dynamic. In opposition to Justin's open-ended questioning, Mr. McDonald provided a model to follow and allowed students to practice presenting their scientific knowledge within that structure. Although Mr. McDonald did not interrupt or guide students *during* their presentations, he evaluated their adherence to the presentation model. Finally, Pastor Martin enacted explanatory

probing not only by providing guiding questions to the learners, but by co-constructing their responses and participating in the activity as a learner. We note that these subtle yet significant differences in enactment were made visible by our focus on a specific practice and analysis that zoomed into interactions among a wide range of adults and children in a multiplicity of settings, across time and space.

Therefore, this study has implications for how educators and researchers conceptualize connected learning. As our practice-based analysis shows, a focus on the enactment of these common practices reveals nuances and differences that can influence the learning environment and learner's experiences. From this perspective, we argue for the coordination of learning practices across neighborhood ecosystems so that children might be exposed to all flavors of the practice of probing for understanding. For example, identifying the ways in which facilitators in an informal learning setting enact explanatory probing may assist in the designing of such learning environments to promote other forms of probing that create different learning experiences. Additionally, coordinating how, when, and where these practices are enacted across neighborhood settings can ensure that children have many and varied opportunities to show their learning in different ways.

Due to the exploratory nature of our questions, we note the limitations of this initial analysis. First, while our analysis allowed us to describe each interaction in detail, we cannot speak to each practice's frequency in the observed settings. In other words, we did not attempt to determine which types of probing for understanding happened most often but sought instead to characterize how those interactions played out, *when* they played out. As described in our Methods, we purposefully selected interactions that covered a wide range of settings, facilitators, learners, and activities to show the full spectrum of the practice. We do not assume that these interactions are a representative sample of all interactions during our study. Additionally, we want to make clear that our analysis does not entail a judgment of each of the practice's flavor. We do not suggest that one or another subtype of probing for understanding is *better* or worse than the other; nor we intend to prescribe a type of probing to a setting or person. Our findings along with the limitations of our study point to the importance of future work in coordinating learning experiences across settings by arguing for an integration of practice analyses in those coordination efforts.

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