

# Negotiating With the Task to Encourage Generative Collaboration in Teacher Workgroups

Anthony Matranga, California State University San Marcos, amatranga@csusm.edu  
Melinda Sebastian, Syracuse University, msebasti@syr.edu  
Jason Silverman, Drexel University, js657@drexle.edu  
Valerie Klein, Drexel University, vek25@drexel.edu  
Wesley Shumar, Drexel University, shumarw@drexel.edu

**Abstract:** This study examined the generativity of practicing mathematics teachers' interactions in small groups working on a task designed to scaffold evidence-based assessment practices. Results showed that participants largely shared and compared information, except one group that focused on the difficulty they had with the task. Our findings indicate the task functioned as a boundary object, supported identification - a mechanism of learning - and disrupted norms for politeness that are pervasive in teacher professional development.

## Introduction

Learners engaging in generative interaction is key for knowledge co-construction (Scardamalia & Bereiter, 2014). We define generative interactions as critical discourse such as questioning and critiquing ideas, negotiating meaning, sharing alternative perspectives, as well as synthesizing ideas (Gunawardena, Lowe, & Anderson, 1997). In teacher professional development (PD) settings, generative interactions are not the norm because teachers tend to follow norms for politeness and agreement (Grossman, Wineburg, & Woolworth, 2001). Previous research shows the promise of scaffolds such as leadership roles (Turner et al., 2018) for impacting generativity of teachers' interactions. The purpose of this study was to examine the generativity of discourse used by 24 practicing mathematics teachers working in small groups on an assessment task during a PD workshop and relating these interactions to the social context that supported their emergence.

We conceptualize PD as boundary encounters between communities of teachers and communities of teacher educators (Sztajn, Wilson, Edington, & Meyers, 2014). Further, such encounters are mediated by *boundary objects* - objects that have validity in multiple communities, interpretive flexibility and facilitate communication between multiple communities (Star & Griesmer, 1989). Participation at the boundary mediated by boundary objects can promote learning mechanisms such as *identification*, that is "defining one practice in light of another, delineating how it differs from the other practice" (Akkerman & Bakker, 2015, p. 142). The PD task in this study was designed to function as a boundary object and promote generative collaboration. As an analytical lens, boundary object allowed us to interpret teacher utterances as representing discourses unique to the communities that engage different types of assessment practices afforded by the task.

## Data and methods

This study is part of a multi-year ethnographic investigation of mathematics teachers' collaboration in a four-year PD project. This study focused on the initial face to face workshop of the PD and our data included transcripts from each of the eight group's one-hour conversations while working on an assessment task. The task was designed to scaffold participants' engagement in evidence-based assessment practices that include looking at a pile of student work, tagging the work with short descriptions, looking for patterns in these tags to identify themes in student thinking, and then generating questions that can support students to think more deeply about the math.

We coded each turn of talk in the transcripts using the Interaction Analysis Model (Gunawardena et al., 1997), which allowed us to characterize the generativity of participants' interactions into five phases: sharing and comparing (Phase I), discovery and exploration of dissonance (Phase II), negotiating meaning (Phase III), testing and modifying ideas (Phase IV), and synthesizing and applying ideas (Phase V). We then documented themes in the generative interactions (utterances coded at Phase II through V) and related these themes to features of the learning environment.

## Results and discussion

Consistent with past research, the results of our coding show that it was not the norm for participants to engage in generative interactions. On average, we coded 314 talk turns in each of the eight groups, 90% or more of the interactions were coded as Phase I, and we characterized a majority of the groups as *task completers* who politely and efficiently completed the task. The exception to this was group B, which had 33 talk turns coded as generative (Phase II-V). The following shows an example of a generative conversation from this group.

- Laurie:** The difficulty I'm having with tag is to me, tags should be short, like a question. (PII)
- Laurie:** but I'm more inclined to want to make a small paragraph rather than trying to find one or two words to condense it. I just ... I can't do that. (PII)
- Ben:** I give you permission to write small paragraphs (laughs). (PIII)
- This students' work, I'm looking at it and what I found intriguing was the progression of numbers
- Laurie:** that she used. So, here, yes, I can use one word. The, you know, the number progressions you chose. But on some of these where I have questions ... (P3)
- Linda:** I would agree. That's my ... That's what ... That was my issue is I was trying to tag as well and I was like, I really wanted ... Like I could do algebraic mistake. (P3)
- Linda:** That's not too bad. But I wanted ... Like I would have liked to have asked her, "How did you come up ... How did you know those were equal?" Like I wanted more explanation. (P3)
- Ben:** Yeah. The richness in looking at student work seems to be in having a conversation about it, right? (P3)
- Ben:** Which the tags don't necessarily allow you to do. (P3)

This conversation shows participants grappling with the idea of tagging student work because of their wanting to write short paragraphs or questions as feedback to each of the students and overcoming norms of politeness typical in teacher PD. Our interpretation is that the task supported participants in articulating their existing assessment practices that writing individualized feedback to the student. In this context, the idea of labeling student work in order to uncover themes in student thinking appeared to *promote dissonance* for the group. Nevertheless, we see participants begin to develop labels such as "algebraic mistake," and thus begin to *negotiate* with the task by proposing "statements that embody compromise." For this group, the task appeared to support them in overcoming politeness norms because the task became the point of discussion, rather than one another's ideas. Because the disagreements were about the task itself, there was no hesitation to define a novel approach to assessment (labeling and parsing student work) in light of their existing practice of writing individual feature. Therefore, we argue that the task elicited generative talk that contributed to participants experiencing the learning mechanism of identification that otherwise might not have occurred.

## Conclusion

In our experiences, learners' difficulties with a task are typically regarded as something that needs to be immediately clarified by a facilitator. Our work shows that allowing learners time to engage dialogue with one another around difficulties they have with a task can be generative and that it can disrupt typical social norms for politeness. Moreover, it may be that peers encouraging colleagues to share disagreements with a task (e.g. see Ben's first utterance) can elicit generative dialogue. Future work is needed to better understand how a boundary object functions within a social ecology to impact generative interaction for social knowledge construction in PD.

## References

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